THE

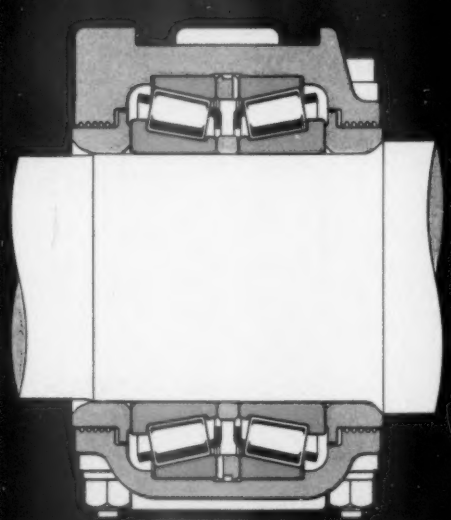
RAILWAY GAZETTE

Price: Two Shillings | FRIDAY, OCTOBER 27, 1961 | Annually £5 by post

On the 'Yorkshire Engine' Shunting Locomotives for British Railways

The twenty 170 h.p. Diesel-Hydraulic Shunting Locomotives which have been ordered from Yorkshire Engine Company Ltd. by British Railways are equipped with Timken bearings.

The line drawing shows a section through the axlebox which is equipped with two high-capacity Timken tapered roller bearings. These locomotives weigh 28 tons at rail and are employed on B.T.C. Yards of the Midland Region. They replace old Saddle Tank Steam Locomotives.



British Timken, Duston, Northampton, Division of The Timken Roller Bearing Company. Timken bearings manufactured in England, Australia, Brazil, Canada, France and U.S.A.

TIMKEN®

REGISTERED TRADE-MARK

tapered roller bearings

Famous Trains

GREAT BRITAIN

air conditioned by STONE-CARRIER

Photograph by courtesy of Metropolitan-Cammell Carriage & Wagon Co. Ltd.

BRITISH RAILWAYS' NEW DIESEL PULLMAN TRAINS

These six- and eight-car trains, operating on the Midland and Western Regions respectively, represent the greatest advance in travelling standards and operating efficiency yet achieved on the railways of Britain. Superbly equipped, they are the first passenger trains fitted with air-conditioning in this country. J. Stone had the privilege of supplying the air-conditioning equipment, together with the auxiliary power equipment, lighting, speedometers and other accessories.

STONE PLATT GROUP

J. STONE & COMPANY (DEPTFORD) LTD

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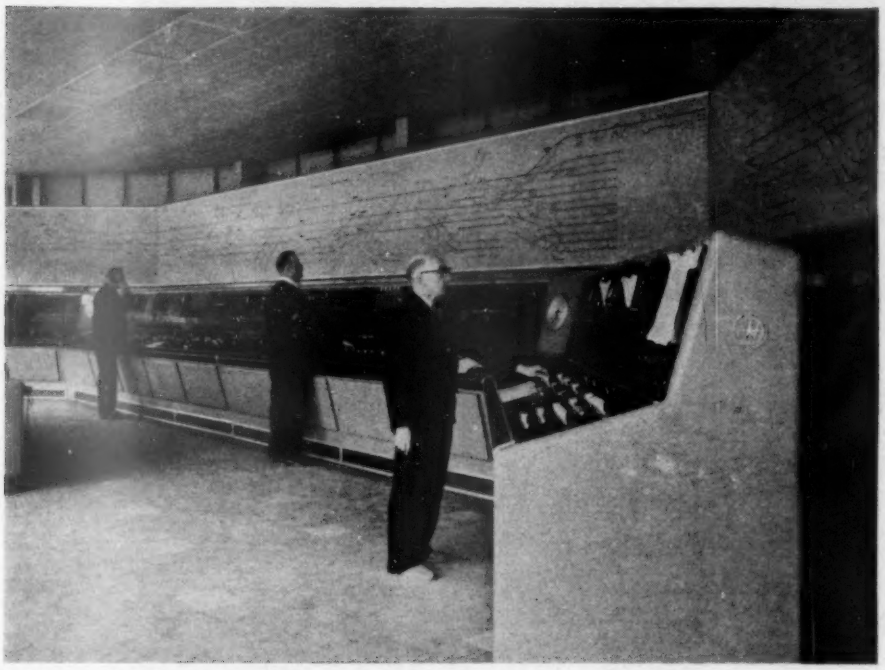
Crewe-Manchester Electrification



O.C.S. control desk and illuminated diagram at Manchester (Piccadilly)

First part of the Midland Region of British Railways 25 kV 50 cycle A.C. Electrification Programme

WESTINGHOUSE

SIGNALLING

INSTALLED THROUGHOUT

Part of Relay Room at Sandbach showing miniature plug-in relays

includes the resignalling of the main lines from Sydney Bridge, Crewe, to Piccadilly and Oxford Road, Manchester, with a route-setting relay interlocking system with control desks, illuminated diagrams, electro-pneumatically operated points and "Westronic" remote control.

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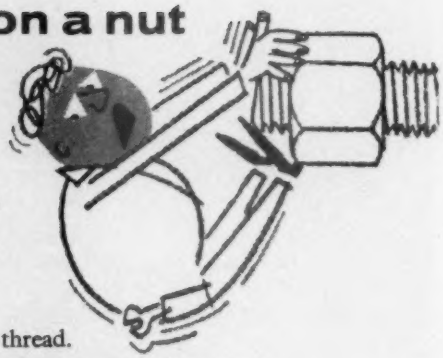
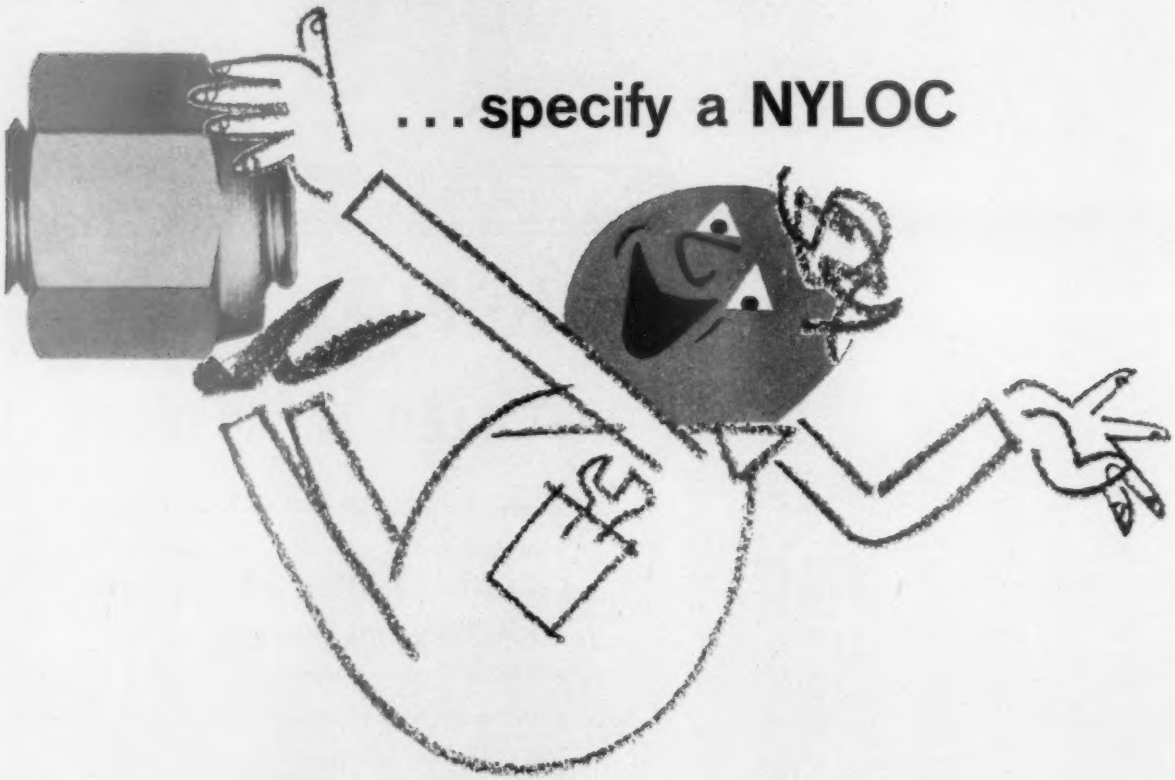
Westinghouse Brake & Signal Co. S.A. (Pty.) Ltd., Johannesburg.
Agents—Bellamy and Lambie, Johannesburg.

...when everything depends on a nut



A lot can depend on a single nut—safety, efficiency, your reputation as a manufacturer. If that's the sort of exacting role the nut has to play, there are six good reasons why you should choose a Nyloc:
* Nylocs are self-locking anywhere on the bolt thread. * Nylocs stand up to shock, vibration, oil, corrosives and extremes of temperature.
* Nylocs can be used again and again. * Nylocs don't damage the bolt thread.
* Nylocs have no extra bits and pieces to fit or get lost. * Nylocs save time and money (it takes 40 minutes to assemble 100 ¼" Nylocs as against 60 minutes to assemble 100 ¼" full nuts and jam nuts*)
If you want still more reasons, send for the Nyloc brochure—it's free and includes complete tables of all Nyloc types, sizes, threads, materials and finishes.

* *These times are based on 'The Handbook of Standard Time Data for Machine Shops' by Haddon & Genger published by Thames and Hudson Limited, London.*



...specify a NYLOC

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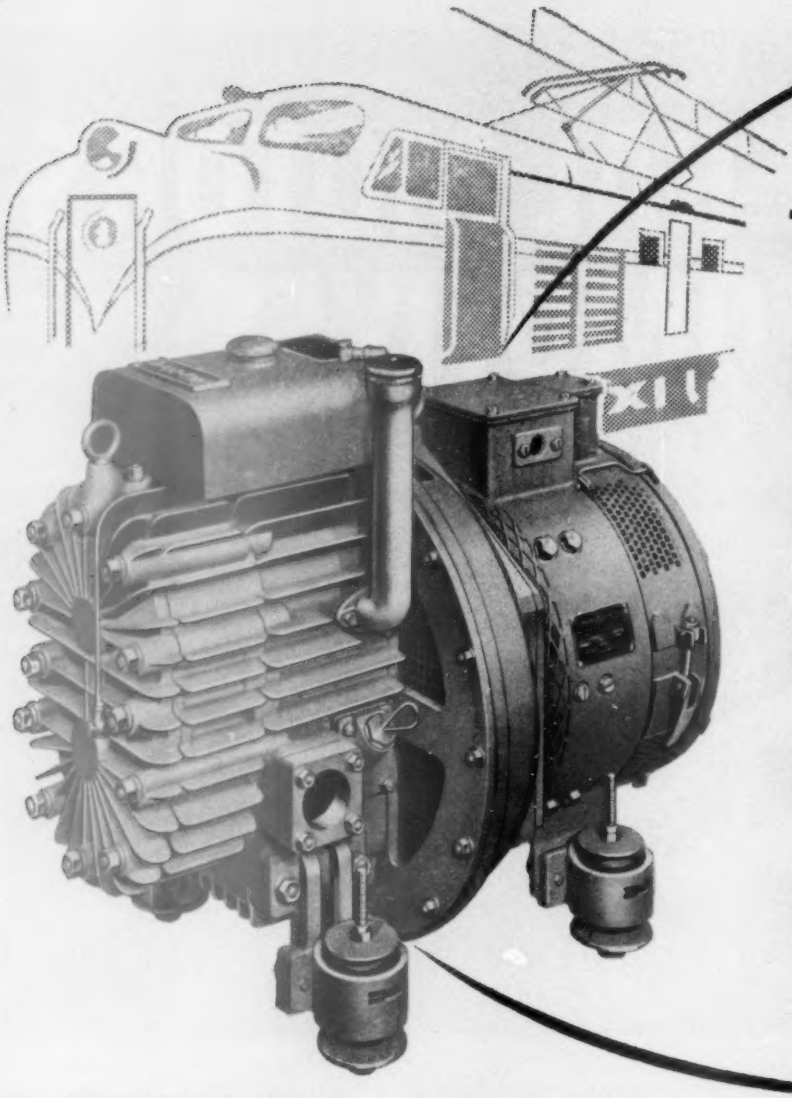

The NEW Northey Flange Mounted Rotary Exhauster

TYPE 125 R.E.F.M.
NOMINAL SWEPT
VOLUME 125 c.f.m.

NOTE: Large capacity (250 c.f.m.) machine also available.

Northey Exhausters are manufactured for Gresham and Craven Ltd. by Northey Rotary Compressors Ltd., Parkstone, Dorset.

- ***sets new minimum space and minimum weight standards for Diesel and Electric Locomotives***
- **Exhauster weighs only 205 lbs. Length overall (with motor) approx: 30 inches.**
- **PERFORMANCE—ONE EXHAUSTER ONLY AT RELEASE SPEED.**
- **21″ Hg Vacuum against ⅜″ leak hole. Guaranteed oil consumption not exceeding 1 gallon per 1000 hours running. Now in full production for Diesel Electric and Diesel Hydraulic Locomotives for British Railways.**

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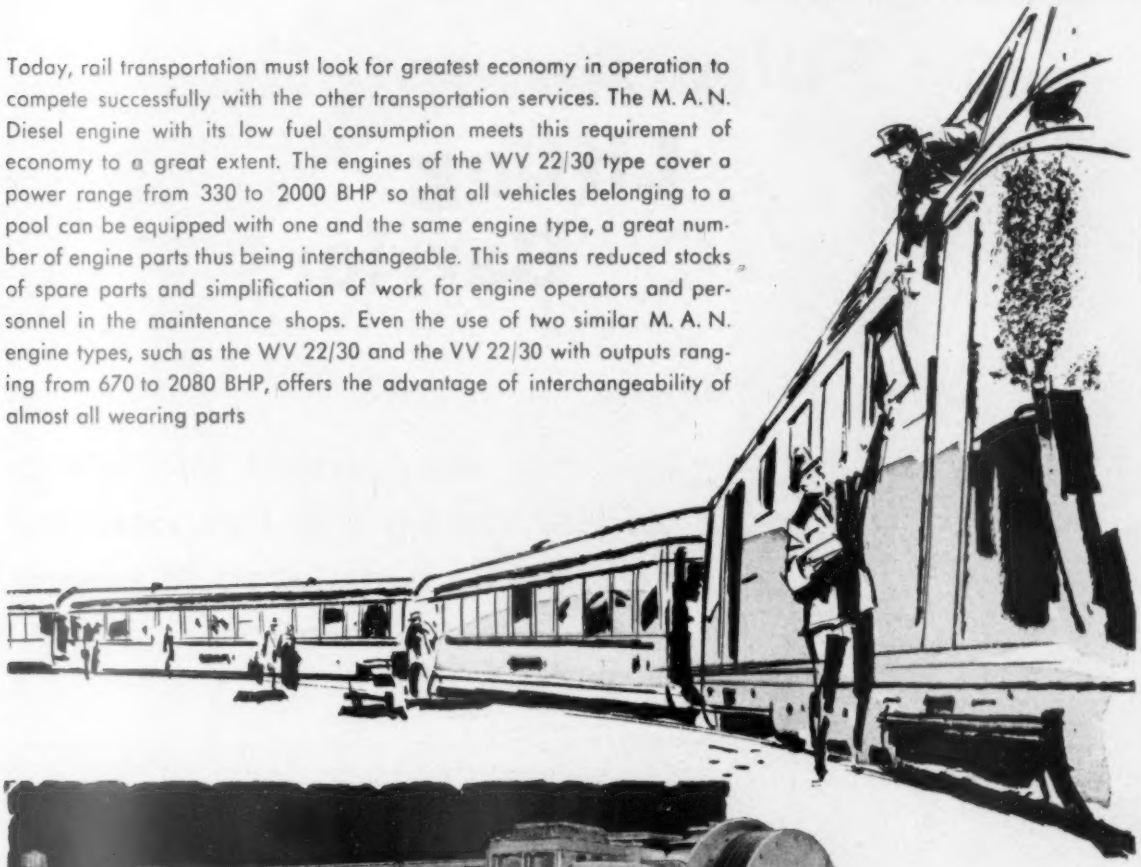
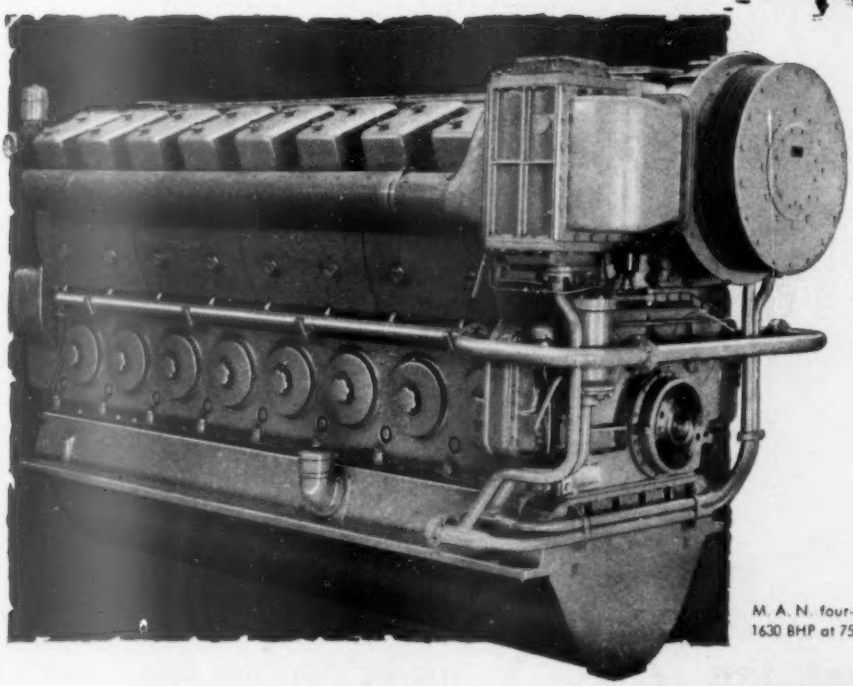
Head Office and Works: Brake Division, P.O. Box No. 4, Norfolk Street, Worsley Road North, WALKDEN, Manchester.
Tel.: FAO 2041 (14 lines) 'Grams: BRAKE, PHONE, WALKDEN, MANCHESTER

GJ830

M·A·N -DIESELS FOR RAIL TRACTION

Today, rail transportation must look for greatest economy in operation to compete successfully with the other transportation services. The M. A. N. Diesel engine with its low fuel consumption meets this requirement of economy to a great extent. The engines of the WV 22/30 type cover a power range from 330 to 2000 BHP so that all vehicles belonging to a pool can be equipped with one and the same engine type, a great number of engine parts thus being interchangeable. This means reduced stocks of spare parts and simplification of work for engine operators and personnel in the maintenance shops. Even the use of two similar M. A. N. engine types, such as the WV 22/30 and the VV 22/30 with outputs ranging from 670 to 2080 BHP, offers the advantage of interchangeability of almost all wearing parts





M. A. N. four-stroke Diesel Engine type V 8 V 22/30, 1630 BHP at 750 r. p. m. or 2000 BHP at 950 r. p. m.

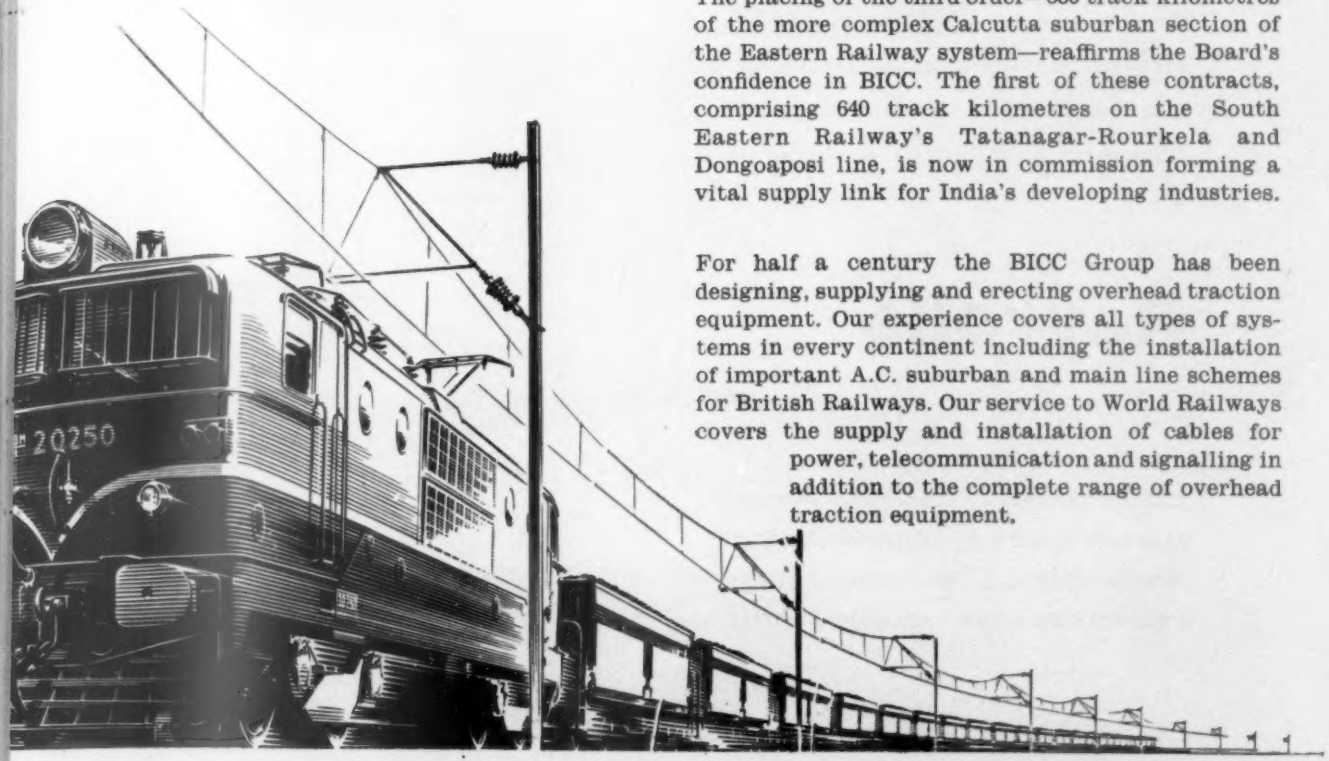
MASCHINENFABRIK AUGSBURG-NÜRNBERG AG · WERK AUGSBURG

INDIAN RAILWAYS

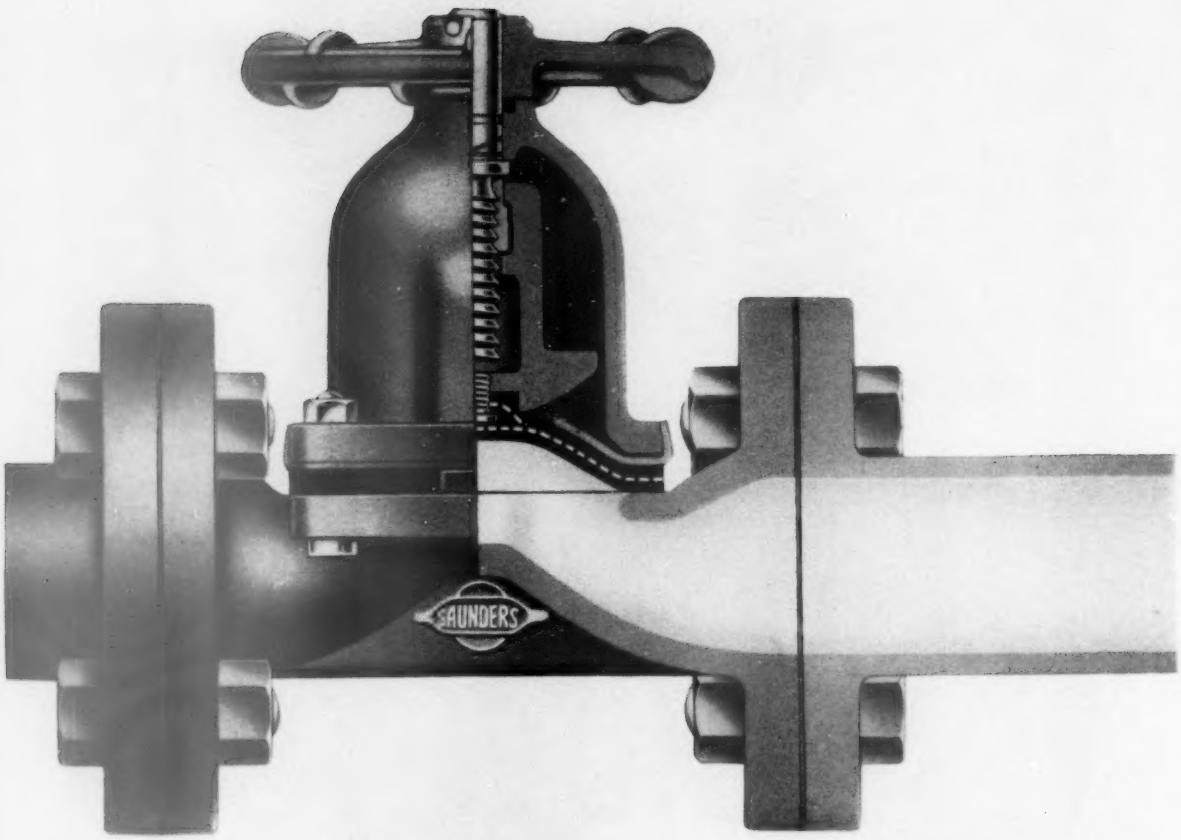
1500 track km. of A.C. Electrification by the BICC GROUP

The BICC Group has now been awarded its third successive contract since 1958 from the Indian Railway Board for 25kV 50 cycles electrification systems. The placing of the third order—380 track kilometres of the more complex Calcutta suburban section of the Eastern Railway system—reaffirms the Board's confidence in BICC. The first of these contracts, comprising 640 track kilometres on the South Eastern Railway's Tatanagar-Rourkela and Dongoaposi line, is now in commission forming a vital supply link for India's developing industries.

For half a century the BICC Group has been designing, supplying and erecting overhead traction equipment. Our experience covers all types of systems in every continent including the installation of important A.C. suburban and main line schemes for British Railways. Our service to World Railways covers the supply and installation of cables for power, telecommunication and signalling in addition to the complete range of overhead traction equipment.



BRITISH INSULATED CALLENDER'S CABLES LIMITED, 21 Bloomsbury Street, London, W.C.1, England



DIFFERENT - - to handle Vacuum as safely as Pressure

For Vacuum many factors have to be considered. There are Saunders Valves for use on most vacuum services and the Saunders Valve Research Panel is at the disposal of any enquirer with problems in this field.

SAUNDERS DIAPHRAGM VALVES

with reinforced diaphragms are eminently suitable for the increasing number of vacuum applications encountered in modern industry.

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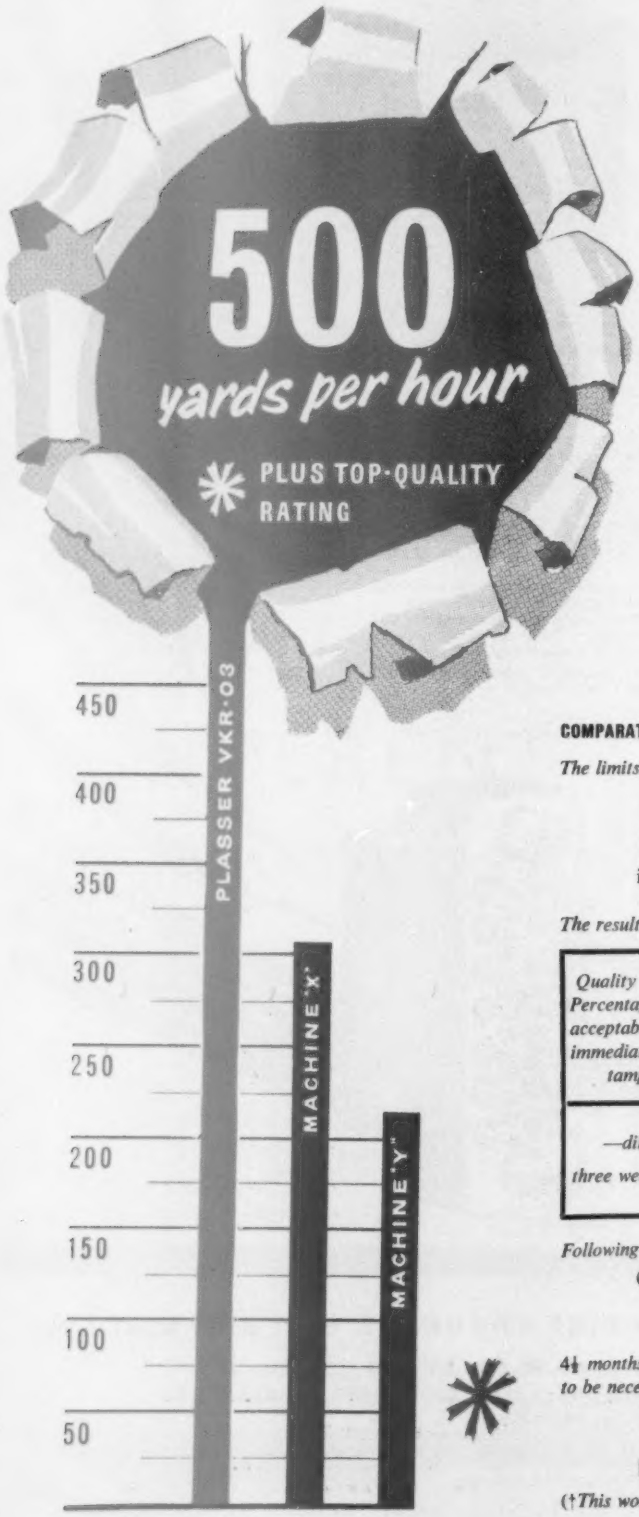
outstanding achievement!



Remarkable results from Board of Trade Test carried out last May on three different manufacturers' normal production models on-track tamping machines. The results proved conclusively that the PLASSER VKR-03 is far superior to its competitors, both in speed and quality of work.

The test was carried out on a Class ' A ' track, average speed 75/80 m.p.h. 95 lb. B.H. material, 60′ rails, timber sleepers, on a compounded curve 62-85 chains radius, having cants of 3″ and 2″ respectively.

COMPARATIVE TESTS OF ON-TRACK BALLAST TAMPING MACHINES

The limits laid down were as follows:

i. For longitudinal level—Rate of change not to exceed $\frac{3}{16}$″ in 15′ 0″.
ii. For cross level—Variation not to exceed $\pm\frac{1}{8}$″.
iii. For voids—Not to exceed $\frac{1}{8}$″.

The results obtained were:

		Machine 'X'	*Machine 'Y'*	*PLASSER VKR-03*
Quality of work Percentage inside *acceptable limits, immediately after tamping.*	*Longl. Level*	77½	77	91
	Cross Level	28	59	77
	Voids	92	93	98
—ditto— three weeks later	*Longl. Level*	78	77	93
	Cross Level	8	41	45
	Voids	95	87½	98

Following the second set of measurements it was found:

(1) The cross level errors *outside* **the acceptable limits on the Plasser length were reasonably constant and of the order of $\frac{3}{16}$″ to $\frac{1}{4}$″.**

4½ months after the trials the following measured shovel packing was found to be necessary:

i. Machine ' X ' 95% of the test length was re-worked.
ii. Machine ' Y ' 83% of the test length was re-worked.
iii. PLASSER VKR-03 6% of the test length was re-worked.†

(†*This work was not necessary until two weeks before this report!*)

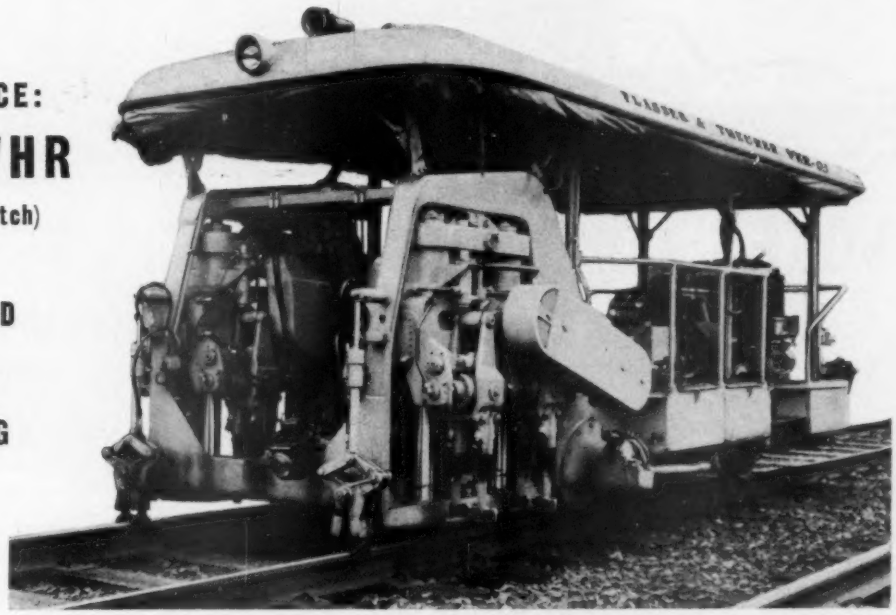
. . . for the PLASSER VKR-03

PEAK PERFORMANCE:

710 YARDS/HR

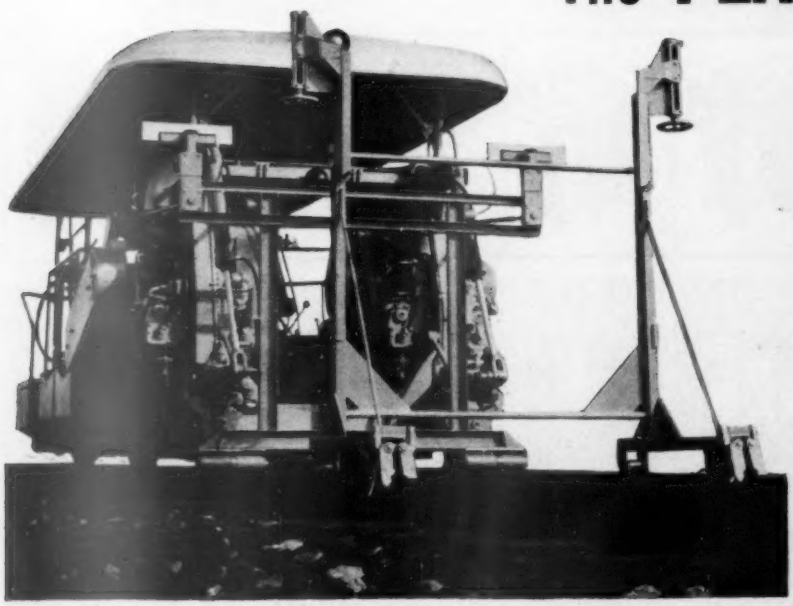
(According to sleeper pitch)

NON-SYNCHRONISED
FULLY HYDRAULIC
ON-TRACK TAMPING
MACHINE



Since 1960 over 150 PLASSERMATIC Machines sold including 20 to the British Transport Commission

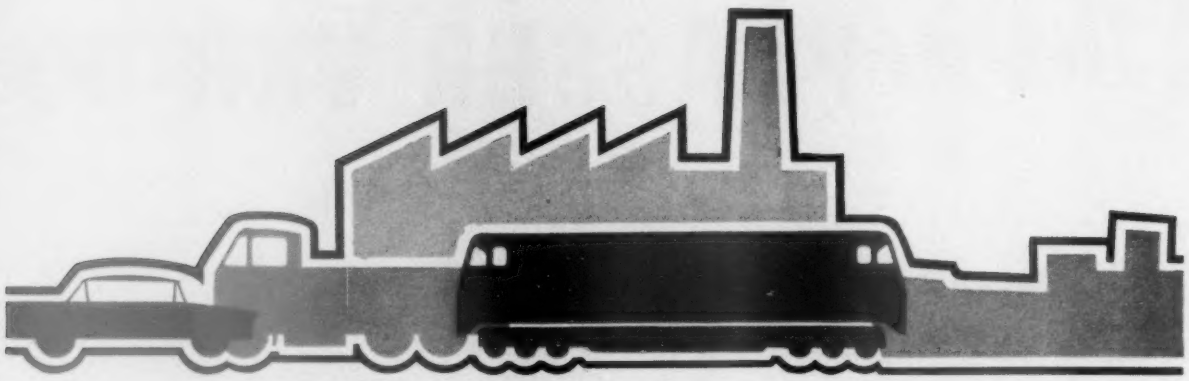
The PLASSERMATIC VKR-04



The PLASSERMATIC VKR—04 Model has all the test-winning features of its predecessor but has, for the first time ever, levelling, lifting and tamping operations carried out *all by the same machine!*

For further information on the PLASSER range of Railway Track Maintenance Equipment, please contact:

PLASSER RAILWAY MACHINERY (G.B.) LIMITED
77-79 Charlotte Street, London, W.1, England
Telephone: MUSeum 4797



VOKES LUBRICATING OIL FILTERS

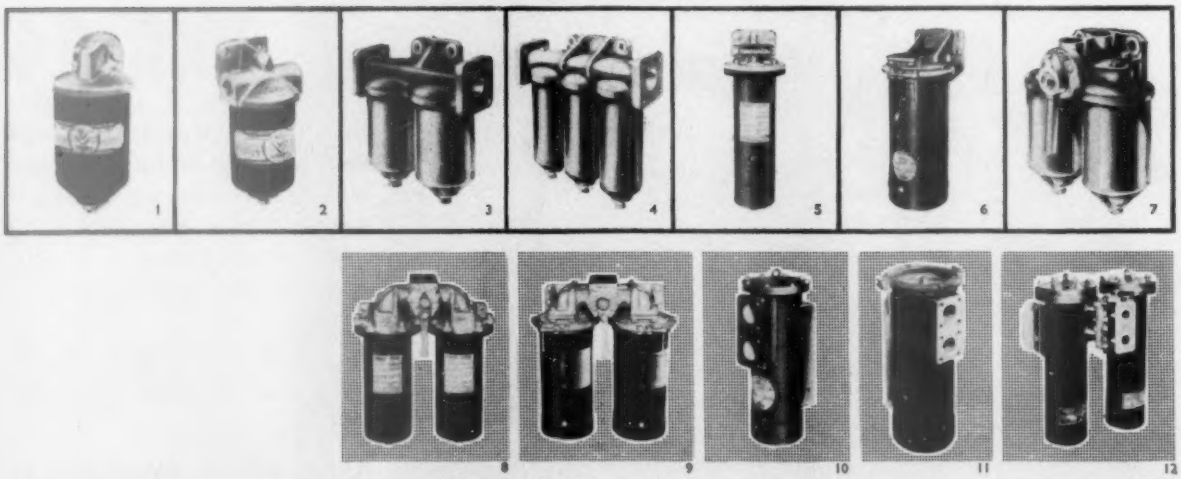
for complete engine protection

Vokes, a wholly British company and specialists for over 30 years in the design and manufacture of high performance filtration equipment, have during this time supplied full-flow lubricating oil filters to the Admiralty, mercantile marine and aircraft industries, and all major engine manufacturers. The easy maintenance and outstanding performance of these filters has now led to their adoption in several nuclear energy projects.

Illustrated below is the standard range of Vokes lube oil filters, made and guaranteed by Vokes for the complete protection of modern bearings and gear boxes. They are inexpensive on first cost, simple to install and the most economical in use. Each filter incorporates Vokes unique by-pass device which ensures a continuous flow of oil should the insert become choked. Other filters are available for special duties and Vokes engineers are always on hand to discuss your particular requirements.

Please write for Section B, Vokes new lubricating oil filter catalogue.

(1) Direct mounting type. Nominal capacities 200 to 700 g.p.h. (2) External pipe type. Nominal capacities 200 to 700 g.p.h. (3) Twin bowl, parallel flow. Nominal capacities 900 and 1200 g.p.h. (4) Triple bowl, parallel flow. Nominal capacities 1200 and 1600 g.p.h. (5) Multibolt head. Nominal capacities 750 to 2000 g.p.h. (6) Single bolt head clamping. Nominal capacities 3000 to 5000 g.p.h. (7) Duplex type, centre bolt fixing. Nominal capacities 200 to 700 g.p.h. (8) Duplex type, multibolt head. Nominal capacities 750 to 2000 g.p.h. (9) Duplex type, articulated clamp head fixing. Nominal capacities 3000 to 5000 g.p.h. (10) "Top Servicing" bolted head plate. Nominal capacities 1000 to 5000 g.p.h. (11) "Top Servicing" articulated clamp. Nominal capacities 3000 to 5000 g.p.h. (12) Duplex "Top Servicing". Nominal capacities 1000 to 5000 g.p.h.



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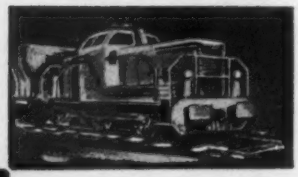

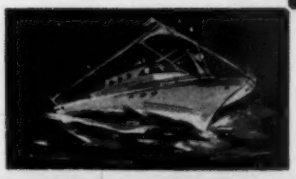

the engine which suits every situation

the engine which is given the most varied applications

175 CO

Semi-finished products for re-rolling and forging — The whole range of flat products — Merchant bars and sections — Wire-rods — All parts for rolling stock — Track material — Special pig irons and steels — High yield strength steels — Diesel engines from 200 to 25,000 hp — Line and shunting locomotives — Complete steam power plant — Equipment for nuclear power projects — Vessels of all types, motor or turbine driven, etc...

It is indispensable wherever a cheap source of motive power and a machine with reduced floor-space are required.

The 175 C.O. type engine has been designed so as to combine the qualities of robustness, long life and low running costs of the slow-speed heavy engines with the advantages of light-weight, reduced floor-space occupied and low purchasing costs of the high-speed engines.
The 175 C.O. type engine, such as it is designed and built, shows all these advantages.

— square engine with light connecting rod system and moderate speed,
— crankshaft rotating in roller bearings with crankcase-tunnel: perfect rigidity of the assembly,
— overhead camshaft: accurate control of the valve movements,
— large-capacity water pump: even temperature in the cylinder blocks and cylinder heads,
— double oil sump and double oil pump : contact minimized between oil and combustion gas, longer life for the oil bath,
— high rigidity of the cylinders and high water pressure: no cavitation, no erosion,
— all auxiliaries are gear-driven: no chain, no belt,
— the filtering of fuel, oil and air is of the highest efficiency,
— the Ricardo Comet V pre-combustion chamber permits the use of low grade fuels.

Whichever is the problem you are faced with, a 175 C.O. type engine is the solution.

Apply to our Departments; their specialists will help you efficiently.

SERAING **COCKERILL-OUGREE** (Belgium)

C18/603

CLYDE BUILT SMT GLASGOW MACHINE TOOLS

UNDERFLOOR WHEEL LATHES

We have to thank the Chief Mechanical Engineer (Railways), London Transport Executive, for permission to publish the above photograph of the Underfloor Wheel Lathe of our manufacture installed at the Piccadilly line depot at Northfields. This machine has been in production for a considerable period, and is enabling very useful economies to be made in maintenance time and costs.

In recent years the problem of bogie maintenance has been considerably modified by the adoption of improved designs of axle boxes, suspension and brake equipment. It is now only necessary to dismantle bogies at long intervals on account of these items, but tyre turning is still a frequent necessity, so great economies are possible if the tyres can be returned without removal of the wheel-set from the vehicle. This machine enables this to be done, and the heavy dismantling and reassembly associated with the removal of the wheel-set from the vehicle can be eliminated.

In order to ensure a truly circular and concentric wheel, the wheel-sets are accurately located between centres, but most of the vehicle weight is still taken through the axle boxes. During cutting, the wheel-set is driven by rollers acting on the sides of the tyre, so arranged that they will accommodate any variation in width of tyre. A variable speed drive is incorporated, allowing the optimum cutting speed to be used for the particular tyre steels and conditions of wear encountered. Speed, also feed, can be changed while cutting is in progress.

As the train is drawn on to the Lathe, the accurate positioning of the axle is ensured by a special device, and the tool rests are moved into their working position by hydraulic power.

The tooling incorporates our Hydro-Mechanical Profiling, providing a simple, accurate and economical method of machining the whole of the tyre profile. When required, as in the case of six-wheeled bogies, etc., different profiles can easily be obtained without removal of the vehicle from the machine. Throwaway tool tips are used, avoiding tool grinding at depots where such facilities are not always readily available. Attention is paid to chip breaking and removal of chips.

These machines incorporate a number of patented features, and others which are the subject of patent applications.

We should be very pleased to hear from Railway Engineers who are interested in this type of Lathe, so that we can prepare schemes for machines to deal with their particular rolling stock, and to fit in with local conditions.

When movement means handling, Paterson Hughes have more experience than most in the design and manufacture of complete mechanical handling schemes for all industries.

COMPLETE CONVEYOR SCHEMES

OVERHEAD TRAVELLING CRANES

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ENGINEERING COMPANY LIMITED

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STOTFOLD: Windsor Works Stotfold Bedfordshire Telephone: Stotfold 481
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for maximum comfort

THE LACE WEB SPRING CO. LTD.

SANDIACRE near NOTTINGHAM

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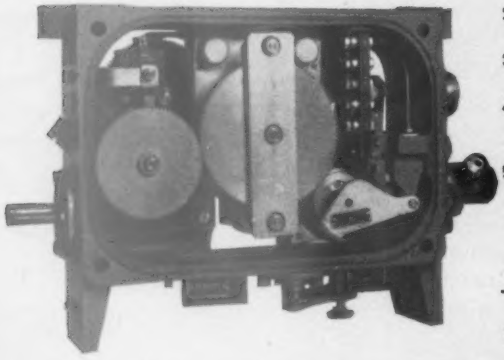
THIS ILLUSTRATION SHOWS BUOYANT LACE WEB SEATING IN PULLMAN CAR SECOND CLASS STOCK. MANUFACTURED FOR THE PULLMAN CAR COMPANY LTD., BY METROPOLITAN-CAMMELL CARRIAGE AND WAGON CO. LTD.

The Nigerian Railway Corporation have recently put into service two of these Twin Unit Diesel Railcars, supplied by the Drewry Car Co. Ltd., and built by Birmingham Railway Carriage & Wagon Co. Ltd. Each unit is fitted with Metcalfe-Oerlikon Patent Safety & Vigilance Control Equipment.

ANOTHER INSTALLATION OF THE

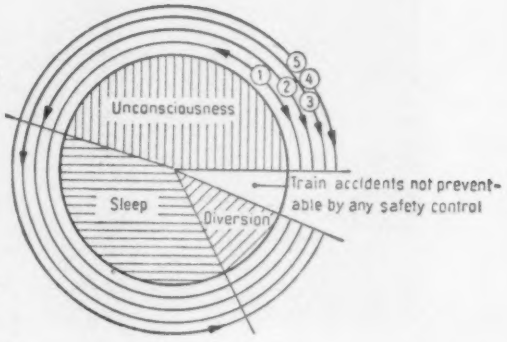
D & M

Automatic Safety &

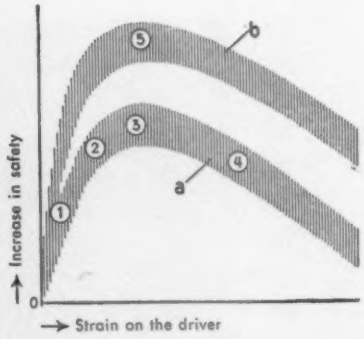


View of the safety side of the apparatus with the covers removed.

1 Normal Deadman's pedal.
2 Encased pedal for instep.
3 Sewing machine type pedal.
4 Pedal which must be periodically released.
5 Normal Deadman's pedal connected with the PATENT SAFETY and VIGILANCE CONTROL SYSTEM.



a Range of existing safety controls with pedals.
b Range of the Metcalfe–Oerlikon safety control.
1-5 Various pedal arrangements as fig. 1.



THESE CHARTS ILLUSTRATE THE SUPERIOR CONDITIONS AND RANGE OF SAFETY OBTAINED FROM THE SAFETY AND VIGILANCE CONTROL SYSTEM.

For full description write for leaflet A.41

DAVIES & METCALFE LTD.

METCALFE-OERLIKON

Vigilance

Control System

The Metcalfe-Oerlikon patent Safety and Vigilance Control System is wholly British made and provides a reliable and simple protection against the Driver becoming inattentive or failing to carry out his duties for any reason whatsoever. The equipment operates on a distance cycle and possesses a number of important features and advantages, further the reliability and effectiveness of this system has been well proved in widespread service on railways for more than twelve years.

The Patent Safety and Vigilance Control System is robustly made and embodies the maximum number of safety features in addition to being completely foolproof in operation. It is now fitted to a very large number of locomotives operating under a wide range of service conditions on railways throughout the world.

A particularly important feature is the automatic cancellation of the equipment by the Driver's normal operation of his controls, including the Master Controller, Brake Valves, etc. This arrangement together with operation on a distant cycle relieves the Driver of distraction or additional responsibility whilst at the same time providing the maximum range of safety. The equipment which has proved to be very popular with Drivers is easily fitted to new or existing locomotives and is suitable for use with all types of Brake Equipment.

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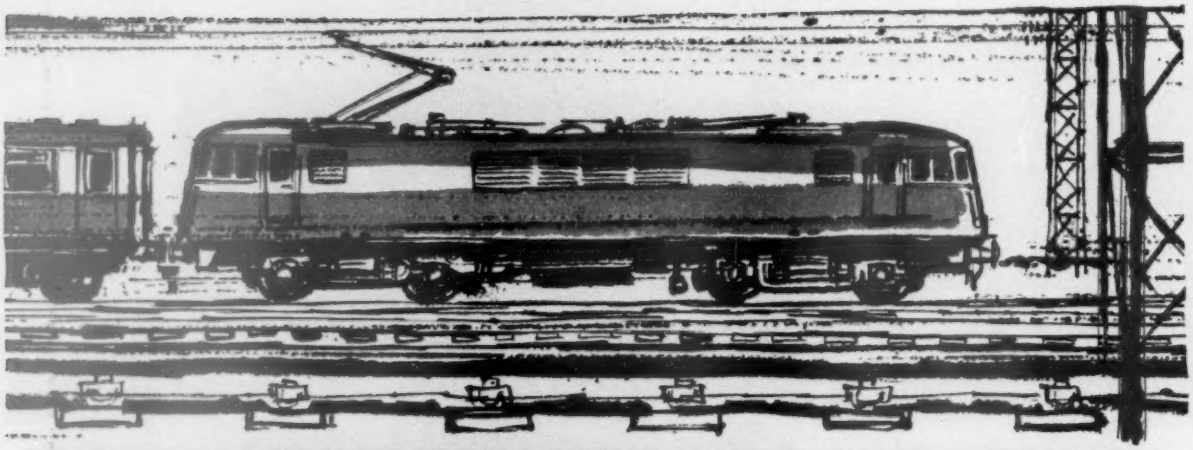
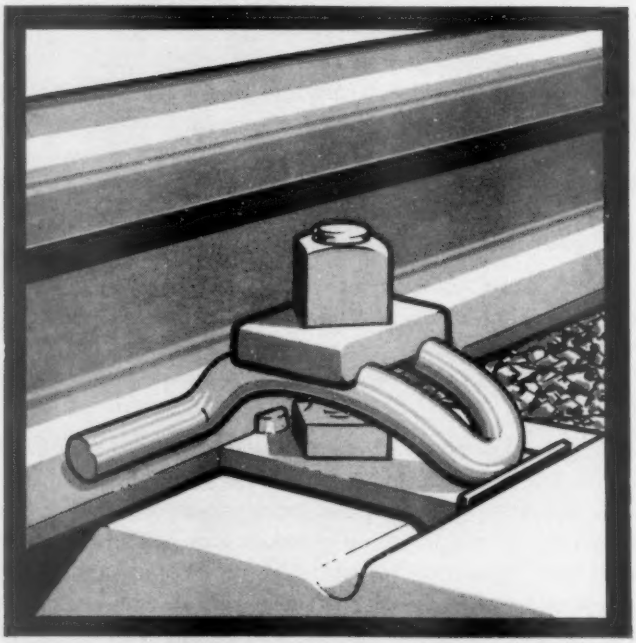
RG11



KEEP TRACK

Today's 100 m.p.h. traffic makes big demands on the track. To help cope with this problem, Bayliss, Jones & Bayliss have developed resilient rail fastenings for use with concrete sleepers and long welded rails. Approved by the British Transport Commission, these tough spring steel fastenings are the latest additions to the BJB range, which still includes, of course, many traditional types of fastening.



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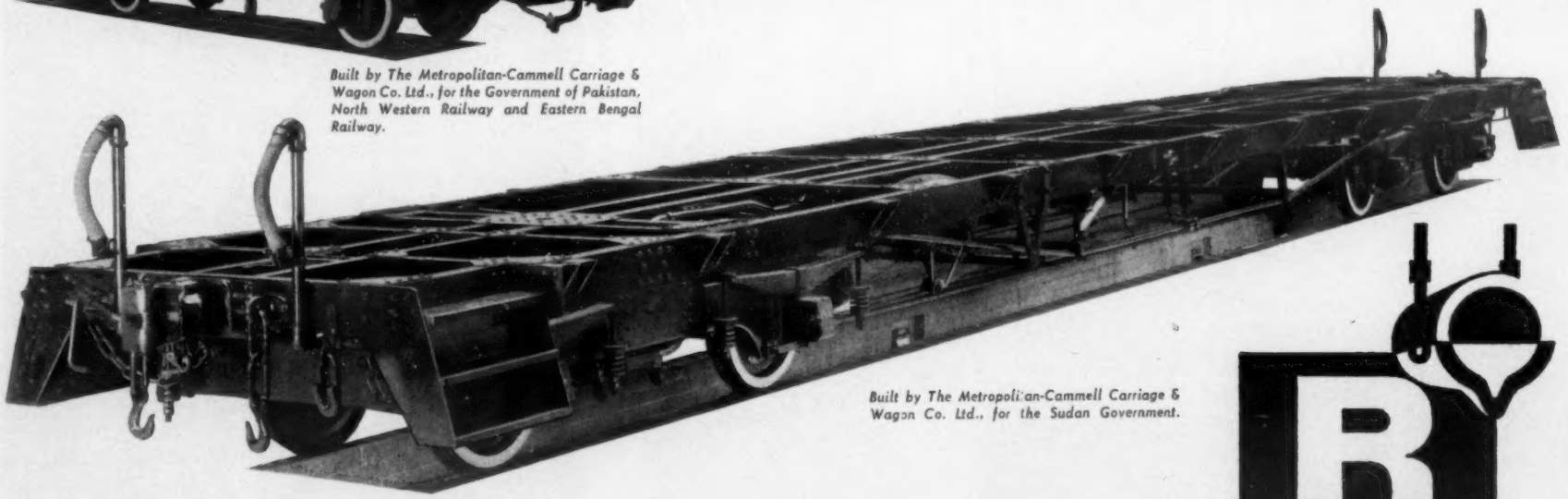

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new developments in signalling by S.G.E.

geographical circuits

The introduction of miniature push-button panels, on which each signal has a single entrance/exit push-button, together with modern line-of-light route indications, has resulted in an increase in the complexity of the non-vital circuits associated with the vital interlocking and control circuits. The cost, engineering and installation effort involved with these non-vital circuits can rival that of the vital circuits they are to control.

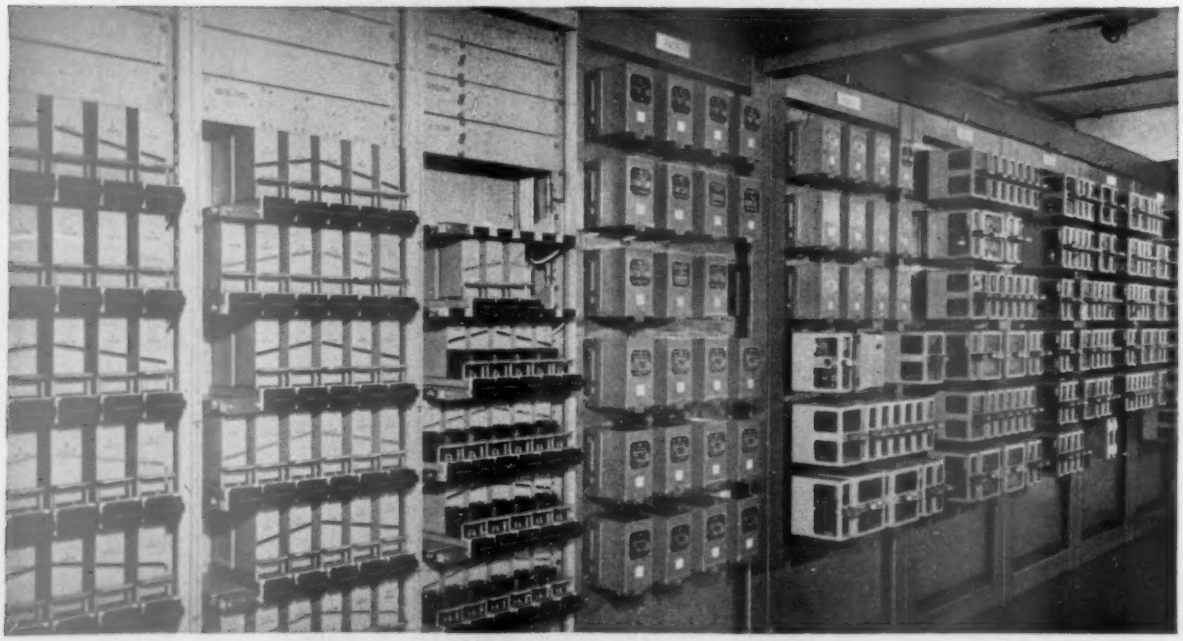
To remedy this state of affairs S.G.E. has designed a system, based on geographical circuit methods, eliminating the need for special circuits. The system makes use of a small variety of standard relay sets, interconnected with each other on a geographical basis by multicore cables. The relay sets are connected to the control panel and signalling circuits by a standardised cabling system again using multicore cables. This allows the correct push button operation to select the required signalling route relay. The illumination, holding and extinguishing of the route lights is automatically carried out.

Typical relay sets used are:—Signal Set, combined Signal Set (controlling main and subsidiary aspects of the same post), Point Set, Track Set and Common Control Set—the latter co-ordinating the operation of all push buttons on the panel. P.O. 3000 type relays are used extensively, and all sets consist of 10-way Relay Plates and covers jacking into cradles mounted on standard relay racks. Each type of Relay Set and mounting plate has its own particular combination of inter-locking pins, to prevent sets being inadvertently jacked into the wrong position.

On the FENCHURCH STREET—BOW JUNCTION section of British Railways, Eastern Region, S.G.E. have introduced for the first time the above Geographical system, for the remote control of Gas Factory Junction and Stepney East from Fenchurch Street.

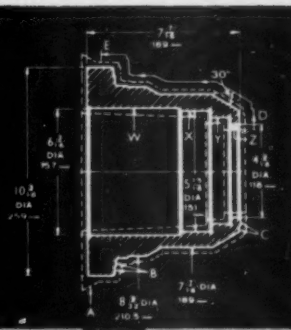
SGE SIGNALS

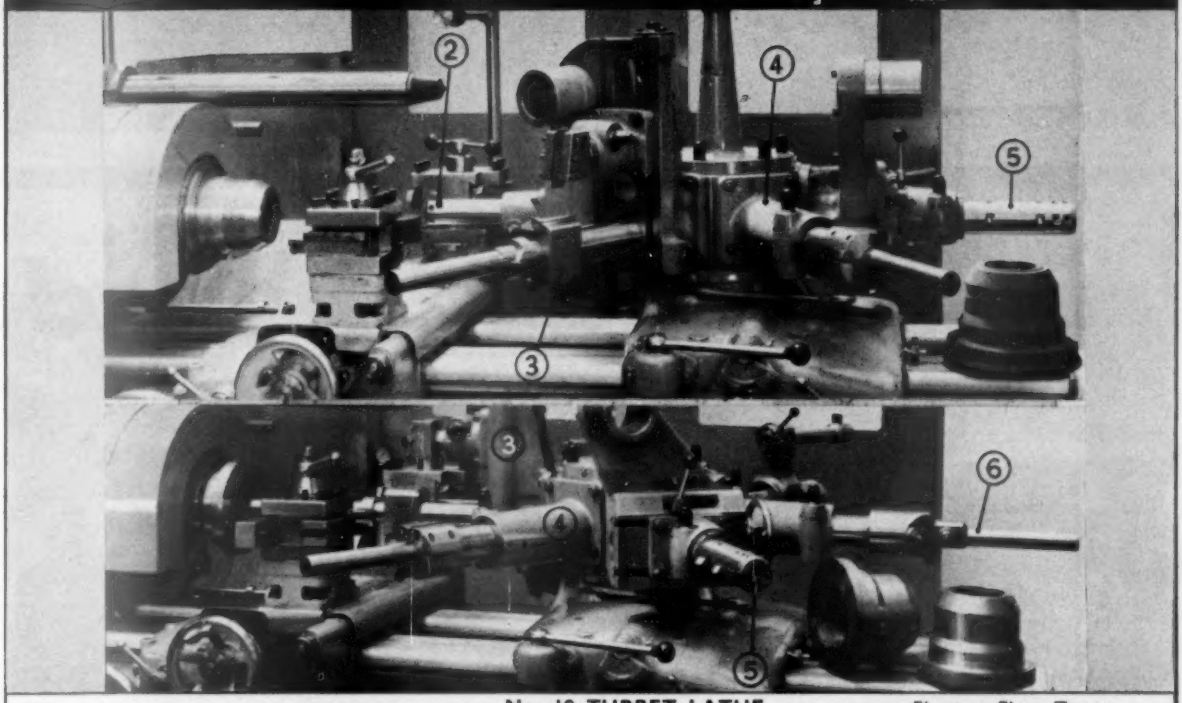
S.G.E. SIGNALS LIMITED, East Lane, Wembley



Ward SPECIAL

TOOLING LAYOUT No. 18





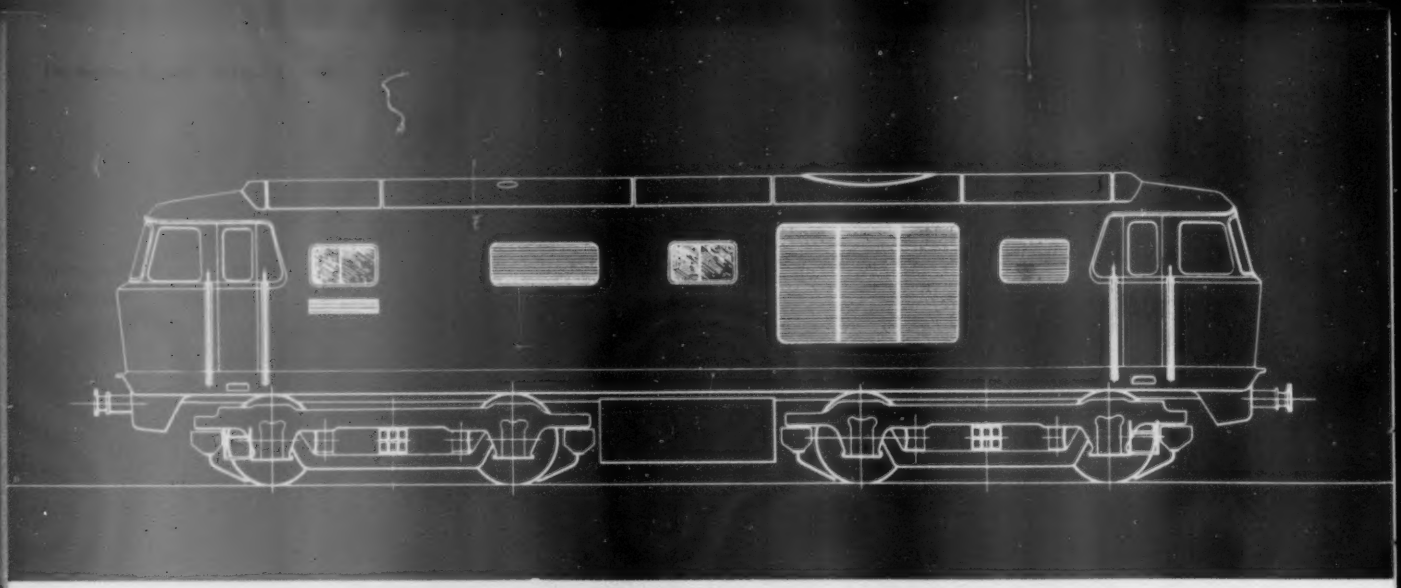
CAST IRON
Machined all over.

PULLEY SLEEVE
Tungsten Carbide Cutting Tools.

No. 10 TURRET LATHE
Code Word : **Covhynant**
Equipped with Hydraulic Copy Turning Attachment and 18" — 3-Jaw Tudor Chuck.

Floor to Floor Times :
1st Process 15 mins.
2nd Process 15 mins.

DESCRIPTION OF OPERATION	Tool Position: Hex. Turret	Tool Position: Cross-slide	Spindle Speed R.P.M.	Max. Cutting Speed: Feet per min.	Max. Cutting Speed: Metres per min.	Feed: Cuts per inch	Feed: m/m. per rev.
1st Process							
1. Grip on "A" in 3-Jaw chuck using loading attachment	1	—	—	—	—	—	—
2. Rough bore "Z"	2	—	125	149	45·4	124	·205
2. Rough double face "B" & "C"	—	S.T.	125	344	105	124	·205
3. Copy turn "D" to "E"							
1st cut — Roughing	—	Rear	125	344	105	64	·397
2nd cut — Finishing	—	Rear	240	667	203	124	·205
4. Remove from chuck using unloading attachment	1	—	—	—	—	—	—
2nd Process							
1. Grip on $7\frac{7}{16}$" dia. in 3-Jaw chuck	—	—	—	—	—	—	—
2. Rough face end (two cuts)	—	S.T.	125	368	112	64	·397
3. Rough turn $10\frac{7}{16}$" dia. (two cuts)	—	S.T.	125	344	105	64	·397
4. Rough bore "Z" & "W" dias. and knee turn $10\frac{3}{16}$" dia.	3	—	155	413	126	64	·397
5. Rough bore "Y" & "X" dias.	4	—	155	241	73·4	64	·397
6. Undercut and chamfer bores	5	—	125	207	63	Hand	Hand
7. Microbore "Y," "X" & "W" dias.	6	—	240	389	118·5	88	·289
8. Remove from chuck	—	—	—	—	—	—	—

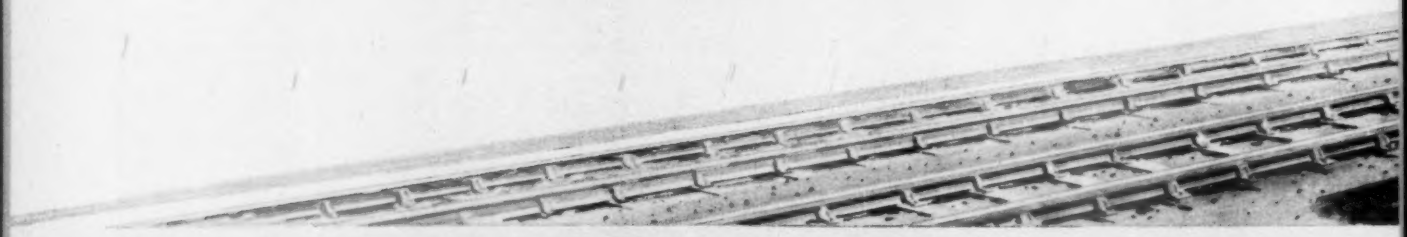


from drawing board..

Hymek

DIESEL HYDRAULIC LOCOMOTIVES

type 3 for Western Region of British Railways



TOMORROW'S LOCOMOTIVES TODAY

TECHNICAL DATA

Wheel arrangement	B-B
Wheel Diameter	3 ft. 9 in.
Horsepower	1,700
Max. axle load	18·5 tons
Total weight	74 tons
Fuel capacity	800 gallons
Engine	Bristol Siddeley Maybach MD 870
Transmission box	Stone-Maybach "Mekydro" K184U
Axledrive gearboxes	Stone-Maybach C33V and 33
Starting T.E.	49,700 lb. (30% adh.)
Continuous T.E.	33,950 lb.
Max. service speed	90 m.p.h.
Train heating	Stone-Vapor boiler

95 of these locomotives are under construction. They are a completely new design with one Bristol Siddeley Maybach high speed diesel engine and one Stone Maybach transmission. A number have gone into full service on Main Line general purpose work in the Bristol area.

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BEYER PEACOCK (HYMEK) Ltd.

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BEYER PEACOCK • BRISTOL SIDDELEY ENGINES • STONE-PLATT INDUSTRIES

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PATENT Registered Trade Mark

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provides an efficient and economic resilient fastening between rail and baseplate. It resists rail creep in both directions and is easily driven and removed with a hammer. It is suitable for use with wood, concrete or steel sleepers.

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INCORPORATING: THE RAILWAY ENGINEER • TRANSPORT • THE RAILWAY NEWS • THE RAILWAY TIMES • RAILWAYS ILLUSTRATED
HERAPATH'S RAILWAY JOURNAL (ESTABLISHED 1835) • THE RAILWAY RECORD • THE RAILWAY OFFICIAL GAZETTE

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Canute and the waves

"THE Guillebaud principle has been repudiated—the unions will not accept this," was the banner headline of last week's *Railway Review*. This assertion was followed by an exposition of the National Union of Railwaymen's feelings on the subject of wage increases for its members. Mr. Sydney Greene, General Secretary of the Union, was reported to have said to Mr. A. R. Dunbar, Manpower Adviser, British Transport Commission, that the Commission need not come to the N.U.R. to make special arrangements to ease its difficulties. The union was expected to co-operate even in closing down part of the railways; it was expected to wait until the railways were able to pay; it was constantly told that happy days were just around the corner—but the corner was never rounded. The Guillebaud "exercise," which had taken nearly two years to complete, had been repudiated: the Commission knew Mr. Greene's view (and he was supposed to be the "quiet one" of the union). He knew what his executive committee would say about it. A stop press announcement in the same issue reported that the Executive Committee had expressed total dissatisfaction at the grounds on which the Commission representatives had rejected the men's claim. An early meeting was to be arranged with A.S.L.E.F. and T.S.S.A. to obtain a unified policy for pursuing the justifiable claims through any means open. The unions should bear in mind the increasing competition to which railways everywhere are being subjected by other forms of transport and also give close consideration to changing economic conditions. Not the least of the latter in the United Kingdom will be the effects of the Common Market, into which it seems likely that Britain will enter and even without which a new and highly-competitive economy would almost certainly have to be developed. The railway unions should remember the lesson learned by King Canute—that an irresistible force may not shift an immovable object, but it will certainly submerge.

Transport and the Common Market

THE Ministry of Transport has set up a division to prepare for detailed discussion of transport problems as negotiations proceed for Britain's entry into the Common Market. Speaking at the annual banquet of the Road Haulage Association at Brighton on October 18, Mr. John Hay, Parliamentary Secretary to the Ministry, claimed the new division had already proved its value and said he very much doubted that Britain would be caught napping in the matter. No doubt Mr. Hay, although speaking before a road haulage audience, also had the railways in mind when he spoke of closer British participation in the vast and growing mass-market for which transport must be found between these islands and the Continent. Through its close ties with the U.I.C., the British Transport Commission already has the advantage of long experience of co-operation with Continental and overseas railways and a considerable existing volume of intercontinental traffic. This experience will be at the disposal of the new division.

Derailment at Sandbach

THE derailment of a parcels train drawn by an electric locomotive at Sandbach last February, was due mainly to the fact that it was travelling at excessive speed. As Colonel J. R. H. Robertson pointed out in his report, summarised on a later page, the composition of the train was such that under the regulations it was limited to a maximum speed of 60 m.p.h. Yet calculations based on the evidence showed that at the point where the first vehicle was derailed the speed could hardly have been less than 70 m.p.h. This vehicle had a slight maladjustment, and there was a slack coupling one van length to its rear. Again the initial derailment happened where there was a slight unevenness in the track. Yet these were minor factors, and, as Colonel Robertson said, they draw attention to the importance of the speed limit. Colonel Robertson thought that the driver paid too little attention to his speedometer and trusted too much to his own judgment of speed. He was misled by the silent running of his electric locomotive. This suggestion may convey a warning to all drivers who change over from one form of traction to another.

Opportunity for exporters

POLAND has announced a five-year development plan covering the years 1961-65. In calling for the investment of 20 per cent of the national income, the plan covers considerable development in communications. Diesel traction is to be introduced on the railways; standardised automatic control mechanisms installed, and a further 1,000 km. of line electrified. Approximate purchases of Polish and foreign rolling-stock will be 220 electric and 450 diesel locomotives, 40,000 goods trucks, and 2,900 passenger coaches. Machine industry is to be expanded; shipbuilding is to be doubled; the production of more electric locomotives and passenger coaches is planned, and other sections of the industry will be developed including factories producing automation products, commercial vehicles, heavy machinery, lathes, and electrical machinery. Long-distance and local buses are to be increased in number, and the programme of road and bridge building expanded.

Directory of Railway Officials & Year Book

THE disappearance of familiar names, and the emergence of new, are prominent features of the 1961-62 edition of the "Directory of Railway Officials & Year Book" (656 pages, price £3), published by Tothill Press Limited, at 33, Tothill Street, London, S.W.1. This is particularly the case as the result of political changes in West and Central Africa, and in the U.S.A. by amalgamations. In the section dealing with Great Britain, details are given of the Government proposals for the reorganisation of nationalised transport and the dissolution of the British Transport Commission. Extensions of electrification in several countries have been recorded, although the figures for North America show a continued decline in the number of electric locomotives in service. A careful scrutiny and revision of all sections of the directory has been undertaken, and useful new features include entries for the Ministries of Transport, or similar Government Departments, in many countries, an article on railcars, and an illustrated description of the revised headcodes on British Railways.

International Congress on Combustion Engines

THE sixth International Congress on Combustion Engines is to be held in Copenhagen from June 17 to 22, 1962, and its theme will be "Recent developments in diesel engines and gas turbines above 3000 b.h.p. and with gas engines above 1500 b.h.p." The Congress will be centred on the Tivoli Concert Hall and 30 to 35 technical papers will be discussed at five technical sessions. There will be continuous translation between the two official languages of the congress, which will be English and French. Works visits are being arranged on three afternoons to cover Burmeister & Wain of Copenhagen, Elsinore Shipbuilding & Engineering Company, and Kockum, Malmoe (Sweden). The seventh C.I.M.A.C. Congress will be held in London during the week commencing April 25, 1965.

Paying one's way

THE desire of Mr. Anthony Lines, a metallurgist who is now an operational research expert, that nationalised industries should cover all their outgoings without Treasury help by making their prices truly reflect the cost of the services they provide is laudable, but not likely to be fulfilled merely by a new attitude in Conservative policy. This is the means by which Mr. Lines seems to think these results might be achieved. In a pamphlet issued by the Bow Group and entitled "Concerns of State," he called for the separation of political and managerial control of nationalised industries. This aim is sound—particularly in respect of the railways, which in this country and elsewhere have been a political scapegoat for many years—but Mr. Lines's thought of economic pricing of services discounts the weight of public opinion now as ever firmly entrenched in the idea that transport should be laid on like the police force, the fire brigade, and the income tax which ultimately ensures accurate pricing of all these services without proportionate regard to user benefit.

F.B.I. on education

SUBMITTING evidence to the Committee on Higher Education set up by the Prime Minister in December, 1960, the Education Committee of the Federation of British Industries has called, among other things, for a new approach to the teaching of foreign languages; university degree courses in certain fields of study not at present covered in this way, and a new form of general degree at honours level. The committee feels that there are grounds for the State to undertake greater responsibility for investment in education and training. It believes that "the higher educational system of this country has not kept pace with the considerable changes which have occurred over the past 20 years in demands made by manufacturing industry on its recruits," and that there is a growing unsatisfied demand for young men and women capable of forming judgments on complex matters. It is also thought that colleges of advanced technology and technological faculties of universities should be regarded as being of equal status.

Dutch development centre

MR. J. P. KOSTER, General Manager of the Netherlands Railways, opened at Utrecht on October 6, the first stage of a special transport development centre at the works of Werkspoor N.V. Additional to a test erection for checking the heating and ventilation of passenger coaches, this initial stage has a permanent exhibition of examples of polyester construction already applied by Werkspoor, including a complete toilet compartment; an air-suspension bogie which had covered 90,000 miles; different types of seating laid out alongside each other, and models and illustrations showing the development of Werkspoor motive power and rolling-stock over a period of 40 years. One exhibit is a coach bogie built in 1918 and acquired from the Netherlands Railways when it was recently withdrawn from service. A temporary exhibit was a Werkspoor 450-b.h.p. oil engine which had run over 1 million miles in a multi-car train; but this has now gone back into service.

Revised British Standard

A REVISED B.S.1452 provides for a transverse test as a control test on grey iron castings, but no longer allows it to be used as a substitute for the tensile test. The basis of determining the number of tensile tests to be carried out has been amended in line with modern foundry practice. Mechanical tests will not now be carried out on grade 10 unless specifically required by the purchaser. The revision specifies requirements for seven grades of grey iron castings. The methods of test, dimensions of test bars and test requirements are specified, and details are provided about the process of manufacture, moulding, freedom from defects, the provision of test bars, inspection and testing facilities. Three appendices are included giving the requirements of the transverse test, the approximate variations in strength of the material according to section thickness and typical properties of grey cast iron. Copies of this standard may be obtained from the British Standards Institution, Sales Branch, 2 Park Street, London, W.1, price 5s. each. (Postage will be charged extra to non-subscribers.)

Ceramic-tipped cutting tools

THE CARBORUNDUM Co. Ltd. recently showed in London its three latest industrial films, one of which, "The winning tip," dealt with the development of the ceramic-tipped cutting tool. It showed in close-up the results which can be obtained by the application of this tool. Remarkable savings both in speed of operation and tool cost are claimed for cutting instruments

with ceramic tips; as much as 60 per cent reduction in the first and 40 per cent in the second. These cutting tools have been successfully applied to turning, facing, milling, and profiling operations and on ferrous metals, chilled iron, leather, rubber, paper, and plastics. The film showed the machining of cylinder liners and pistons for diesel engines at the works of Mirrlees Bickerton & Day Limited. The extension of the use of these tools in railway workshops and maintenance depots may commend itself to the railway engineer.

Transistor train controls

THE transistor is coming to be applied to some of the major elements in railway operation, and at the moment is being embodied in some 60 multiple-unit motor coaches in North America in the form of a transistorised control. Evolved by the General Electric Company, this simplified cam magnetic system incorporates an extensive use of static components in place of interlock and relay contacts in the control circuits, and these components are mounted mainly on plug-in assemblies. There is said to be a reduction of one-third in the number of wearing parts in this S.C.M. system than in the conventional types hitherto used in multiple-unit surface and subway stock. A single camshaft type of controller reduces the number of items carrying main current and provides positive mechanical interlocking of the power switches mounted on it, and the transistorised circuits provide quick yet cushioned application and release of traction and dynamic braking efforts.

Practical steps for exports

THE September decline in exports, to £297 million against £324 million in August, is disappointing. Even when allowance is made for special factors which swelled the August figure, the most that can be said is that there is no serious decline. Indeed, looking back on the first nine months of 1961, exports have shown an improvement of four per cent over the previous year.

This is not nearly good enough. The latest survey by the Federation of British Industries suggests that many manufacturers are beginning to have unused capacity. Surely this provides an opportunity for a fresh export drive. Ministers themselves are not unsympathetic. Mr. Maudling, in his swan-song at the Board of Trade, implied at Brighton that the Government would do anything not inconsistent with " our international obligations."

One question is: Are we making full use of our existing and legitimate machinery? On September 15 we discussed the facilities provided by the Export Credits Guarantee Department. This discussion can now be taken a stage further.

The main Act governing the Department has three principal sections. Section 1 covers the bulk of the Department's operations. It authorises all guarantees by the Department in the normal course of trade and within its powers, provided that they are approved by the Department's Advisory Council.

Section 2 provides for those cases where the Council does not feel justified in giving its approval, but where there is a case for the business in the national interest. In such cases, the business is brought to the notice of the Treasury by the Department itself and not by the applicant. After consultation with other Ministries the Treasury can authorise approval.

Typical cases are " marginally difficult countries." Such a country may have an unstable government, or not enough may be known about its economic and commercial conditions to justify the Advisory Council giving its approval. Yet as a long-term measure it may be essential for us to establish or maintain a foothold in such markets.

There have also been special cases, such as those of guarantees for the export of British aircraft.

Section 3 deals with loans granted by the British Government direct to overseas governments. Here the Export Credits Guarantee Department acts simply as the channel or " honest broker." It does not initiate the business, nor are its own funds at stake. The business is done between government and government, and any loss falls directly upon the Treasury.

Now it may be that we have to conform to our " international obligations." Yet the United States has its Export-Import Bank and its Development Loan Funds, France and Germany have their close-knit links between their governments, industries and banks. And all these three countries conform to their international obligations.

As we have already pointed out, there are dangers in commercial banks investing their funds in industrial concerns. If we thought it desirable to set up anything akin to either an Export-Import Bank or a Development Loan Fund, then Sections 2 and 3 of the Act governing the Export Credits Guarantee Department provide an obvious jumping-off place. It would be merely a question of building on to an existing foundation.

There is one all-important question: If we finance British exports designed for the development of a certain overseas country, will that development make that country viable? Assume, for example, we finance the building of new railways, which in turn permit of the development of new industries, agriculture and mining. Will the result earn its keep ?

Actually, it ought to do more. It ought to add so much to the productivity and prosperity of the country as to enable it to increase its standard of living, to expand its exports, and to put it in a position where it can buy more from other countries, including ourselves. At the very least, if we finance a railway or other project, we should see a reasonable chance that the recipient country will add to its prosperity enough to cover the interest and amortisation of the money we advance.

Initially British exports financed by a British loan will do nothing to help our balance of payments. Exports and loan will cancel each other out. So we have to take the long view. Will our loan foster an existing market or create a new market? If so, the operation is worth while, even if it gives no immediate help to our foreign exchange reserves. We can also take the long view from another important angle: If we do not finance the project, will some other country do so? And will the result be that we lose a potential market?

All these are questions to be weighed in the balance. The vital point today is for us to realise that our export trade depends upon a forward, dynamic policy. One of the first things for us to do is to review our existing machinery, and see if it can be improved, developed and extended.

The outlook for railways

IN his presidential address—" Railwaymen look ahead "—to the Railway Students' Association on October 18, Mr. A. R. Dunbar, Manpower Adviser, British Transport Commission, spoke of the future for railways and railwaymen, the form future railways might be expected to take, and the kind of railwayman needed to run those railways. If there was one solution above all others which would put British Railways back on the rails it was not a single technical development, nor a physical modernisation plan by itself, nor a trick of the market brought about by legislation, and certainly not a re-creation of the railways of the past which did so well. Railway thought and way of thinking must be reorientated and rationalised.

Mr. Dunbar referred to the pioneering spirit of the early railwayman; the bewilderment and frustration of the present-day railwayman and his vacillating sense of pride in his industry and in himself, and the probable qualities of the railwayman of the future. These were difficult to describe and even more to difficult to acquire, yet they were essential to the health of the industry. The new railwayman must have a sense of purpose. He must be ready to learn new skills and techniques, and be encouraged to use them with the highest productivity. He must be able to give a service he could be proud of and once more be an example to the world.

However much profitability might have fallen because of reasons beyond the railways' control (and Mr. Dunbar could not accept that all remedies had been used), the cold hard fact remained that the demand for more railways at their present price and in their present form did not exist. Unless a better service were produced at a lower cost, railways must go out of business. There was no substantial reason why the country should continue to subsidise a form of transport for which no one wanted to pay. The best way out of this was to raise productivity, to provide a better service at a lower cost, and to use less men to carry more goods to the greater satisfaction of the customer. The problem was a big one, probably bigger than any faced in any industry before. A good way of reducing labour costs was to mechanise—this was being done and would be continued in shunting, goods handling, signalling, track maintenance, office work, and other heavy man-using railway work.

Railways had an assured place in the economic life of the country only where they could exploit their great advantage of moving substantial quantities in train-loads, using the expensive track equipment effectively throughout the day. Busy lines would remain and be made busier by taking over other traffic. Train-crew manning and station manning should be considered afresh. The standard of full use should require the timetable in many cases to be reconstructed, beginning with the principle of the best service which could be produced by a given number of trainmen and train equipment.

Mr. Dunbar predicted a pattern of railway working with fewer lines, stations, and men, but men whose work had been better planned, who were more skilled and adaptable, and who were adequately paid. Every part of the work would have to be sifted and examined to discover whether it was worth doing, and being done in the most sensible way. The success of work study on the railways had been great in the sphere of maintenance, producing increases in productivity of 100 per cent in some cases. Financial savings had naturally not been proportionate. Increased standards of maintenance, a growth in the value and complexity of the equipment to be maintained, and the distribution of incentive bonuses to staff which contributed to the rise in productivity had led to actual savings of something between 10 per cent and 20 per cent. Referring to manning of trains, Mr. Dunbar thought there might well be a reconsideration of the whole problem in the light of present-day experience and a new forecast of freight train working requirements. One Continental railway administration had been entirely turned over to electric traction and single manning applied to 98 per cent of its services—locomotive-hauled as well as electric multiple units. On several Continental railways fully-fitted freight services were run without a brakevan in the rear and, as the number of such services increased in the United Kingdom, British Railways would be bound to consider whether the differences which existed in the operating practices of the several countries concerned were sufficient to justify the continued use in Britain of brakevans on such trains.

Engineering maintenance was another large item in railway working costs. It had seen substantially improved methods in recent years through the increasing use of machines, an emphasis on using replacement materials which saved maintenance, and the introduction of work study. The existence of systematic training schemes was a great attraction to potential recruits. If British Railways was to obtain its fair share of school and college leavers at different ages it must be able to compete with other employers in offering them this training. There had been a change in climate: where it used to be enough that the system of advertising vacancies gave everyone a fair chance of getting promotion, today people expected an assurance that they would be taught a trade with a future, and were more suspicious of apparent "dead-end" jobs.

The railway manager of the future would have to be a man of the world in the best sense; he must be at home in the spheres of commerce and industry and constantly on the alert for new trends and markets, and ready to recognise prevailing economic factors as early as his industrial counterpart. The railway engineer must be well equipped with knowledge of the capabilities of materials and plant, and of modern developments in design and manufacture.

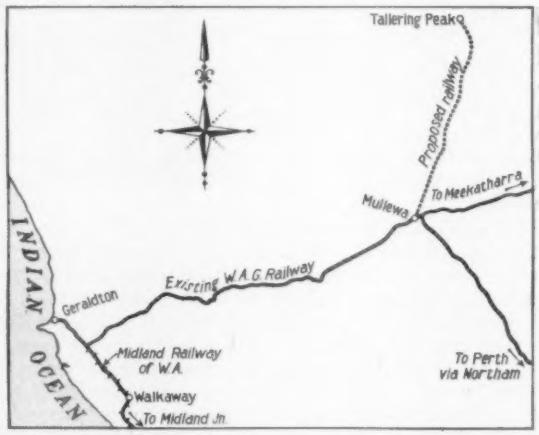
None of the great railwaymen of the past had been great because he had looked back. Railwaymen had been great and had built great railways and a great industry because they had looked ahead. This was the part of their tradition which British Railways must recapture. British railwaymen must also look ahead and must see what they would have seen had they been here.

Australian mining and export agreement

PROVIDING that a six-months' proving programme gives satisfactory results, the Western Mining Corporation, a company with extensive mining interests in Western Australia, is prepared to spend some £A.2,250,000 on the mining and export of iron ore from the Tallering Peak deposit. This deposit is on the northern fringe of the area served by the Western Australian Government Railways, being about 40 miles from Mullewa Junction, which in turn is some 67 miles from the port of Geraldton.

The company will spend about £1,250,000 on capital works which will become the property of the State of Western Australia after five years. These include a proposed railway from Mullewa to the deposit, as well as diesel locomotives, rolling-stock, and bulk-ore loading facilities at Geraldton harbour.

Under an agreement signed by the State Premier, Mr. D. Brand, and the Chairman of the company, Mr. G. Lindsay Clark, on August 10, 1961, the first 2 million tons of ore from Tallering Peak will bring the State about £2,250,000 in royalties, freight, and wharf charges. The company will pay 11s. 9d. a ton freight charge on ore railed from the deposits, and 3s. 6d. a ton wharf charges at Geraldton, plus 6s. a ton royalty.



In addition to the six months in which to prove the economics of the deposit, a further three months have been allowed to the company in which to negotiate contracts for the sale of ore overseas; Japan is a likely market. Export at the rate of 500,000 tons a year is expected. To maintain this rate, the ore will be carred the 100 miles to Geraldton in two 1,000-ton ore trains daily, a 10,000-ton ore ship will leave Geraldton each week.

The route and specification of the new £A.1 million railway, locomotives and rolling-stock are to be approved by the Commissioner of Railways. The Railway Department will provide train crews and service and maintain the locomotives and rolling stock. It will also improve the existing line from Mullewa to Geralton.

At Geraldton, the company will lease an area for stockpiling, and conveyor-type facilities to be established will cost an estimated £200,000, and be able to load a 10,000-ton ship in 24 hr.

A 21-man drilling team is already travelling to Tallering Peak to begin the proving programme. Prospecting will also be carried out in a 50-sq.-mile temporary reserve granted to the company round Tallering Peak, and if iron ore deposits can be proved the agreement will live very much longer than the short-term project involving the initial 2 million tons. The agrement will be presented to Parliament for ratification as soon as possible.

The development of the Tallering Peak deposits, and the use of rail transport from the deposit to the port of Geraldton, will be a welcome addition to railway activity in this area.

Control of diesel-electric locomotives

MR. O. SCHLAEPFER, M.I.Loco.E., Chief Traction Engineer, Sulzer Bros. Ltd., Winterthur, Switzerland, at a meeting of the Institution of Locomotive Engineers on Tuesday last, read a paper on "Control of diesel-electric locomotives." The meeting took place at the Institution of Mechanical Engineers.

The author analysed the whole system of control, beginning with the driver's action and following through the control impulses and their effect on diesel engine, generator, and motors to the wheels. Diagrams made the operations of the controls very clear. Mr. Schlaepfer commenced with the fundamentals of control, explaining that the driver of a modern diesel locomotive controls by automatic means the output of the engine direct from the fuel pumps, through the engine governor, or by a combination of both to obtain a series of effects culminating at the wheelrims.

The driver's signal to the engine is normally conveyed pneumatically to the engine governor. This in turn initiates an hydraulic impulse controlling the fuel pumps and varying the generator load regulator. Generator output is maintained constant for a given engine speed, fuel being increased and output reduced together for a drop in speed and *vice versa*. Any variation in engine-power output at a given speed—resulting, for example, from the failure of one fuel pump or from a loss of charging air pressure—results in a drop in generator output. Within its range of operation, the field weakening of the traction motors is also controlled by the same hydraulic impulse. The original signal given by the driver is thus translated into an exact response at the wheels with adjustments for irregular performance at several stages. The principle of this automatic control system was first laid down in the patents of Hermann Lemp in 1914.

At present, all locomotive diesel engines operate at widely varying speeds, either evenly or in steps, and the driver controls the variation. New ideas propose to make the locomotive speed the controlled factor, the engine speed being set to the power requirements of the motors. This would be a reversal of the present system, but the principle remains of applying the correct electrical load to the engine at each engine speed to correspond with the horse-power output at that speed, both factors being varied to account for changes in output. Devices to signal changes in engine output at any set speed as, for example, a failure of supercharge pressure, were incorporated in the engine governor system.

The size of the generator varies in proportion to the product of the continuous current and the maximum voltage. To reduce the variation in the voltage of the variable-voltage generators, use is made of series-parallel and field-weakening of the traction motors. Field-weakening is controlled either by the load regulator or by a voltage relay. Generator field-weakening also may be used on the same control.

The author pointed out that no load regulator is provided on certain shunters. Instead, a drooping load characteristic is built into the main generator by counter compounding or by counter compounding the exciter. Besides limiting the maximum current, this system reduces the range of the regulator. It should be recalled that the load regulator has to be used right through the locomotive speed range, as any form of electric control on the motors involves additional "jumper" connections for multiple-unit working, which is to be avoided by all possible means. The regulator also can be used to control an anti-slip control, whereby the generator voltage is additionally reduced during wheel-slip.

To a certain extent, the test and regulation of the control system could be carried out by use of the dynamometer car. The location of a fault is best carried out within the locomotive. Mr. Schlaepfer described and illustrated the results of using a Honeywell Visicorder, having recording circuits for eight circuits simultaneously. It can easily be installed in the cab or the engine room of a locomotive.

Developments in load regulators were described. These included the American G.E. "static control" which works on transductors. A complete generator characteristic curve was displayed and a system for the combined use of semi-conductors and transistors for the control of diesel locomotives was described. Developed by the General Electric Company, this has the advantage of eliminating the exciting alternator. The author thought that these control systems could not be regarded as simple enough for their purpose.

The fundamental method of control of the power unit was further dealt with in some remarks on continuous control and notch control as well as the alternative of "plus-minus" control. This means using only two conductors in multiple unit control cables and the driver does not control the rate of change of engine speed, a notching-up device being used.

Decline of U.S.A. passenger train services

BY A CORRESPONDENT

IN August the Bureau of Railway Economics, Association of American Railroads, published its 45th summary of U.S.A. statistics for the years 1950 to 1960. The summary shows in 15 clear tables the trends of railway operations during that time. Perhaps the most striking change was the eclipse of passenger train services. In 1950, the railways ran passenger trains on 146,266 miles of road; by 1960 they withdrew passenger services from 52,373 miles of road. This 35 per cent reduction cut passenger train-miles by 148 million, or 41 per cent, and passenger train-hours by 4·4 million, or 16 per cent. The passenger trains left were worked efficiently; the speed of those hauled by locomotives was 10 per cent faster at 42·8 m.p.h., while passenger locomotive-hours per day rose 36 per cent from 237 to 323.

The trouble was a decrease of about a third in the number of passengers from 486 million to 326 million. The railways lost 74 million, or a quarter of 1950 commuters, who on an average travelled 18 miles; they carried 203 million in 1960, who went about three miles farther and accounted for a third more revenue. Nevertheless, it was thought that suburban train services were generally unprofitable.

Coach passengers numbered 186 million in 1950, travelling about 94 miles each at a fare of $2·3. In 1960, their number fell by 39 per cent to 114 million, paying $3·3 apiece for a run of 117 miles. Despite lavish expenditure on "streamliners," road and airline competition ruined first class rail travel. In 1950 journeys in parlour and sleeping cars numbered 22,695,400, when an average fare of $13·4 was charged for a trip of 411 miles. By 1960, the number of first class passengers shrank to 8,412,000, paying $16·7 for a run of 430 miles. The 62 per cent drop in bookings led to a decrease of 53 per cent in total first class revenue from $303·4 million to $141·4 million.

There was a fall of over 21 per cent in total passenger revenue from $813 million in 1950 to $640 million in 1960. Over the same years passenger service train revenue, including receipts from mail and parcels, dropped from $1,291 million to $1,092 million, or by over 15 per cent. The downward drift continued in the first half of 1961. At June 30, both passenger takings and passenger train service revenue were about 5 per cent below the 1960 level. The outlook is distinctly bleak.

LETTERS TO THE EDITOR

THE EDITOR IS NOT RESPONSIBLE FOR THE OPINIONS OF CORRESPONDENTS

DUAL-VOLTAGE ELECTRIFICATION

October 23

SIR, I am sorry to see that your editorial comment in your last issue on my paper to the Brazilian Federal Railways Conference appears to have been based on your own summary which omits two important paragraphs, as a result of which you have been misled into some unjustifiable conclusions on the dual-voltage a.c. system.

In your editorial you said that: " In particular, his unqualified recommendation of the system when 25 kV. can be used throughout abandons the attempt to find some peculiar virtue in the adoption of two voltages, as has been forced upon British Railways."

The two paragraphs which I quote below contain no justification for any statement of this kind:—

> " If you are considering only the conversion of non-electrified lines to electrification, you will no doubt be able to use 25 kV. throughout. We have no hesitation in recommending that system. If you are also considering the conversion of lines already electrified on the d.c. system in order, for example, to obtain full inter-working without using dual equipped rolling stock, our unique experience may be of especial value to you. Our conversion from 1,500 V. d.c. to 6·25 kV. a.c. has been a success. The conversion of 3,000 V. d.c. lines to 6·25 kV. or even perhaps to 12·5 kV. would present no new difficulties."
>
> " It is still too early to give a full account of all that has been learnt and achieved. In this, the fullest overall appreciation so far available, it is hoped to show that the decision to adopt the 25-kV. 50-cycle system, even in the particularly unfavourable conditions in Great Britain, is sound and that the dual voltage 25/6·25-kV. version of that system can also give a satisfactory account of itself when circumstances demand its adoption."

I think you will agree that if these two statements are taken into account, the inference in the first part of your editorial is unwarranted. As you say, probably no engineer has ever regarded the dual voltage system as otherwise than a nuisance, but so far as comment is possible (pending the issue of Brigadier Langley's final report), I am not aware of any reason why it should not be adopted elsewhere if the circumstances are appropriate and, moreover, I went so far as to commend that solution. Indeed, there may be other countries which find themselves obliged to use dual voltages, as we were ourselves.

Yours faithfully,

J. A. BROUGHALL,
Assistant Chief Engineer

British Transport Commission,
222, Marylebone Road, N.W.1

DESIGNERS AND STYLISTS

October 23

SIR, It is strange that despite the obvious improvement in the design and quality of buildings and manufactured goods, which has resulted during the past 20 years from better understanding between architect and civil engineer, mechanical engineer and industrial designer, there are some like Mr. Bender (your issue of October 13), who still seek to separate the design functions necessary in the development of a good product.

The Design Panel, the membership of which includes top level engineers, was set up by the Commission to advise on the amenity and aesthetic aspects of railway equipment. Its work on rolling-stock, ships, and many other items now coming into service, has been recognised by the national and technical Press as a vital step towards the new and consistent design policy associated with the modernisation plan.

The " fancy-shape windows " and colours to which Mr. Bender lightly refers are, in fact, incidental but important factors in a calculated approach to the combination of functional design with good amenity and appearance. It has been done before by London Transport, British European Airways, the Orient Line, and others. " Styling " is not part of the Design Panel's conception of good design; it has come to stand so much for merely superficial elaboration.

The British railway engineer, with his counterparts throughout the world, recognises that he must use all his ability and resources to keep up with technical developments in his own field and that it would be a miracle indeed if he could also keep abreast with up-to-date trends in industrial design and amenity development. He therefore welcomes the help and guidance of specialists.

So far as credits go, the Design Panel has been at pains to avoid unwarranted claims for the work of its consultants. In all material supplied to the press it has always been made clear that the panel and its consultants have worked in a design team whose members share responsibility in varying degrees for the product. Indeed, it is rare that the panel is mentioned in your journal in reviews of new railway equipment.

It is universally accepted by industry that satisfactory function, amenity, and appearance can only result from the engineer and industrial designer working in close harmony with each other from the beginning and from their freely acknowledging the need for each other's contribution. True design, then, as the panel understands it, is a process that does start from the beginning and works " from the inside outward." The Design Panel was created and so named to promote this more profound concept of good design.

Yours faithfully,

GEORGE WILLIAMS
Design Officer

British Transport Commission,
222, Marylebone Road, London, N.W.1

RAILWAYS AND THE CLERGY

October 13

SIR, I was most interested in the letter in the current issue of the *Railway Gazette* on the subject of the Church and railways. Especially appreciated was the exquisite wit of the closing sentences.

As churchman and railway enthusiast for very many years I have been long aware of this common appeal and suggest this explanation. Christianity (indeed all real religions) is a discipline and yields its fruits by a process of restraint in other satisfactions. The truth of this may be hard to explain, but a railway is the perfect illustration and this may be subconsciously realised. A train on its rails represents a superb freedom in the direction of travel but has sacrificed side-to-side freedom. As it proceeds on its journey the route might offer grim stretches or the loveliness of the countryside, periods of sheer collar work, and long exhilarating runs on the level might alternate. Whatever the conditions, the smooth path of the rails lead onward, and so long as the train retains its integrity with them all is well.

Add to this the fact that railways do little damage to the grace and peace of living and you might be very near the solution your correspondent seeks.

Yours faithfully,

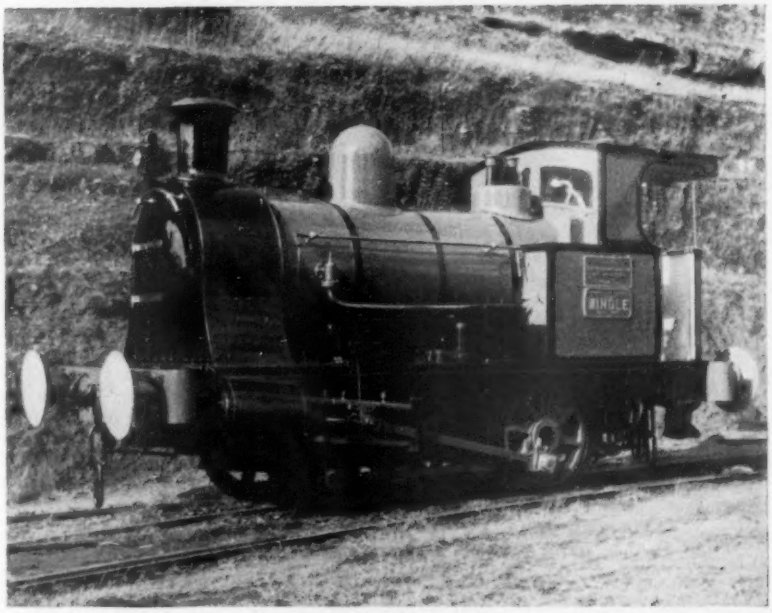
WILLIAM B. STOCKS

22, Heatherfield Road,
Marsh, Huddersfield

The Scrap Heap

Glass-works locomotive

Windle, a steam locomotive which for 52 years has worked in the private sidings of Pilkington Brothers Limited of St. Helens, was recently presented by the company to the Middleton Railway Preservation Society. The locomotive is a "Barrows-type" engine built by Mr. James Cross, one time locomotive Engineer of the St. Helens Railway who set up his own business and designed and built the first of this special type of engine about 1866. The illustration shows *Windle* before being handed over.



"Windle" the 52-yr.-old engine, which was given to the Middleton Railway Preservation Society by Pilkington Brothers Limited

Apologies to Tommy

An item which appeared in "The Scrap Heap" in our issue of October 13, under the title of "Equine exit" stated that the last two "shunt" horses employed by the Eastern Region of British Railways had been retired. We have since been informed that at Newmarket, on the same Region, a "shunt" horse named Tommy is still employed. What is more, Tommy was awarded a prize at the "Horse of the Year" show, this year.

Man-eater

At the recent Royal Show at Nairobi the East African Railways & Harbours displayed the head of a man-eating lion in the window of the coach from which the animal took a railway employee in 1900. In the illustration Mr. G. P. G. Mackay, General Manager, East African Railways & Harbours, can be seen holding the cup presented to him for the best Government Department & Statutory Board display, accompanied by Sir Patrick Renison, Governor of Kenya.

The Governor of Kenya, Sir Patrick Renison (left), and Mr. G. P. G. Mackay, General Manager, East African Railways & Harbours, at Nairobi Royal Show

Tiger hunt

An incident described in the *Journal* of the Swiss Federal Railways, by whose courtesy we reproduce the story, provides an example of the resourcefulness of the railwayman in dealing with the awkward and the unusual. The train carrying two baby tigers, in transit from Brussels Zoo to Zurich, had halted for the night at Basle, where one of the tigers escaped. Unperturbed, one of the porters and a customs officer advanced to the fray.

Armed with a stretcher and a basket, the two discovered the tiger investigating the choice odours issuing from beneath the dining car. The attack was made from both sides. While one man grabbed the emerging tail, the other deftly captured the head of the tiger in the basket.

OVERSEAS RAILWAY AFFAIRS

FROM OUR CORRESPONDENTS

AUSTRALIA

Standard-gauge goldfield railway

The Australian Prime Minister, Mr. Menzies, recently described the new steel industry planned for Western Australia as the most remarkable advance in the State's development since the gold discoveries in the 1890s. He was introducing a Bill to the House of Representatives approving the Federal aid agreement for building a standard-gauge railway line about 400 miles long between the goldfield city of Kalgoorlie and the port of Kwinana, near Perth. It will cost £A17 million and will carry two million tons of ore a year from the iron ore reserves, being developed at Kulyanobbing, to a steel plant to be built at Kwinana by the Broken Hill Pty. Co. at an estimated cost of £A40 million.

Diesels for Commonwealth Railways

The Commonwealth Railways administration has placed an order with Clyde Industries Limited through its subsidiary Clyde Engineering Co. Pty. Ltd. for a further five main-line diesel-electric locomotives, at a cost of over £A500,000. Since the first delivery in 1951, the Commonwealth Railways has purchased all its main-line diesel locomotives from this company.

QUEENSLAND

Mount Isa reconstruction

Work has begun on the £30-million reconstruction of the Mount Isa—Townsville line to enable it to carry large quantities of silver, lead, copper, zinc, and uranium ore from the Mount Isa and Mary Kathleen mines. The standard of the rebuilt line with 82-lb. rails will make possible the running of diesel-hauled 2,600-3,500-ton trains.

NEW ZEALAND

£2,700,000 for rolling-stock

The Railways Estimates before Parliament included £2,700,000 for rolling-stock to meet the much-needed increase. The Minister of Railways pointed out that railway fares had not been increased except on uneconomic suburban lines.

SOUTH AFRICA

Growth of system

The growth of the South African Railways system since 1910 is indicated in recently published figures. In the past 50 years capital invested has increased from £90½ million to £775 million; income from £14 million to £213½ million; goods traffic from 12 million tons to 88 million tons; and length of track from 7,600 miles to 13,564 miles. In 1910, purchase overseas represented 52 per cent of the total requirements of the system; in 1959-60, the figure was only 13 per cent.

Tunnel project

South African Railways are considering building an eight-mile tunnel through the Hex River Mountains in the Cape, according to a statement at a meeting of civil engineers in Cape Town by the system's Chief Civil Engineer, Mr. W. H. Evans. He also said that works since the last war have cost the Railways R.450 million (£225 million).

Largest electroplating plant

The largest electroplating plant in South Africa is being constructed at the South African Railway Workshops at Koedoespoort in the Transvaal. The plant will cost some R.170,000 (£85,000) to build and should be completed in nine months.

CANADA

Rapid delivery of new goods stock

During the four weeks August 24-September 21, the National Steel Car Corporation delivered to the Canadian Pacific Railway, 309 covered wagons of 50-ton capacity, bringing the total delivered against an order for 700 to 672. During the same period 344 similar wagons were delivered by the Canadian Car Company to complete an order for 450. In addition, 96 covered hopper wagons of 70-ton capacity were supplied by Marine Industries Limited leaving only four to complete the order for 100. A 30-ton combined crane and pile driver was also delivered by J. Blackwood Hodge & Co. Ltd.

On order are 300 50-ton insulated wagons and one 70-ton gypsum rock hopper from the Dosco, Trenton Works and National Steel Corporation respectively.

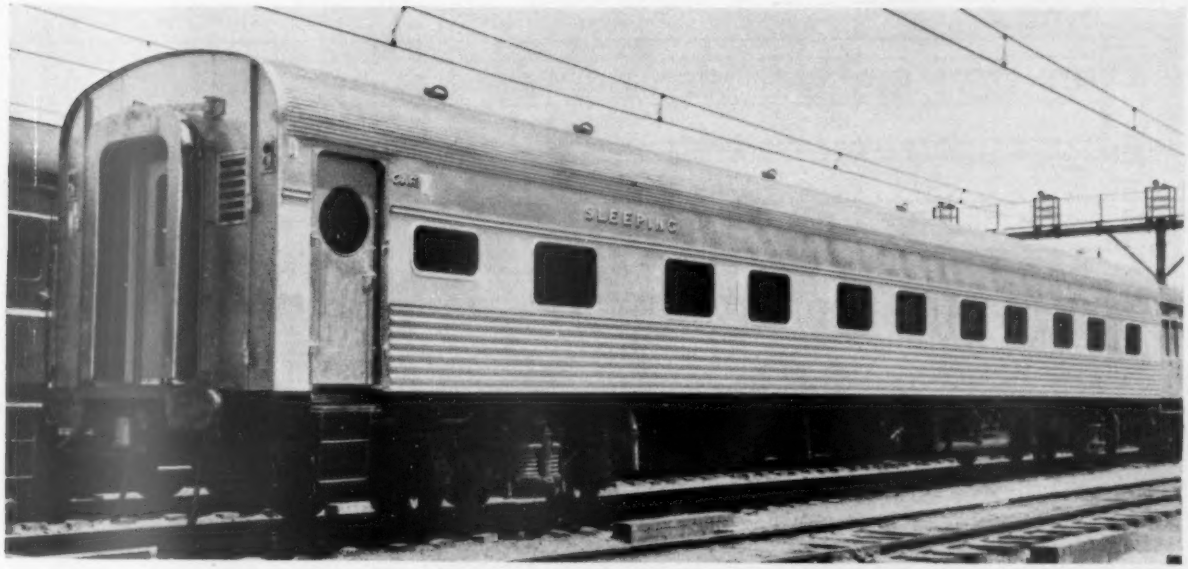
U.S.S.R.

Longest electric railway

On October 11 the world's longest electric railway was brought into operation when the first train ran on the Moscow-Baikal main line. This line runs 3,500 miles across the Soviet Union from Moscow to Baikal, which lies at the southern end of Lake Baikal in Siberia. The electrification of this line will speed passenger and goods traffic by cutting four to five days from the old steam schedules which allowed 12-13 days for the journey. The weight of the trains is to be considerably increased and it is expected that transport costs will be almost halved. Work on the electrification, which was scheduled for completion by the end of the current year, has been finished three months ahead of schedule.

INDIAN HIGH-CAPACITY OPEN BOGIE WAGON

A 56-tonne capacity mineral wagon manufactured in the Mahalaxmi workshop of the Western Railway of India



Exterior of twinette and roomette sleeping cars for "Sydney-Brisbane Limited" service

STAINLESS-STEEL SLEEPING CARS for "Sydney-Brisbane Limited"

Modern sleeping facilities include air-conditioned roomette and twinette sleepers

THE New South Wales Government Railways has not only recently accelerated the "Sydney-Brisbane Limited" expresses but has also provided modern sleeping, buffet-dining, and sitting stock. These trains comprise a brake-van containing heating and lighting equipment for the supply of the whole train, two roomette and two twinette cars, two first class coaches, a buffet-dining car, three second class coaches, and a brake-van, a minimum of 12 vehicles weighing 529 tons, but increased as required by an additional sleeping car and a second-class coach to 14 and 619 tons.

The power brake-van contains two generating sets, and the train now accommodates 80 sleeping-car and 251 day-coach passengers. Comfort has been greatly increased for them. When the train load is only 529 tons it is worked as far as Taree with two diesel units and one only beyond; heavier loadings require two units throughout. These trains are entirely air-conditioned.

Stainless-steel sleeping cars

The new sleeping cars built by Commonwealth Engineering Co. Ltd. are entirely of stainless steel, the panelling, fluted sides, and roof corrugations being unpainted. They are of two types, one having 20 single-berth roomette accommodation and the other ten double-berth twinette compartments.

The roomette is entered by a vestibule at one end only, from which lead an attendant's compartment, a luggage recess, and a toilet, on the way to a staggered central corridor with ten compartments on each side of it arranged longitudinally. Each compartment is 6 ft. 4 in. long and an enclosed space on the inside of the corridor wall is fitted up as a wardrobe and linen cupboard.

Facilities provided

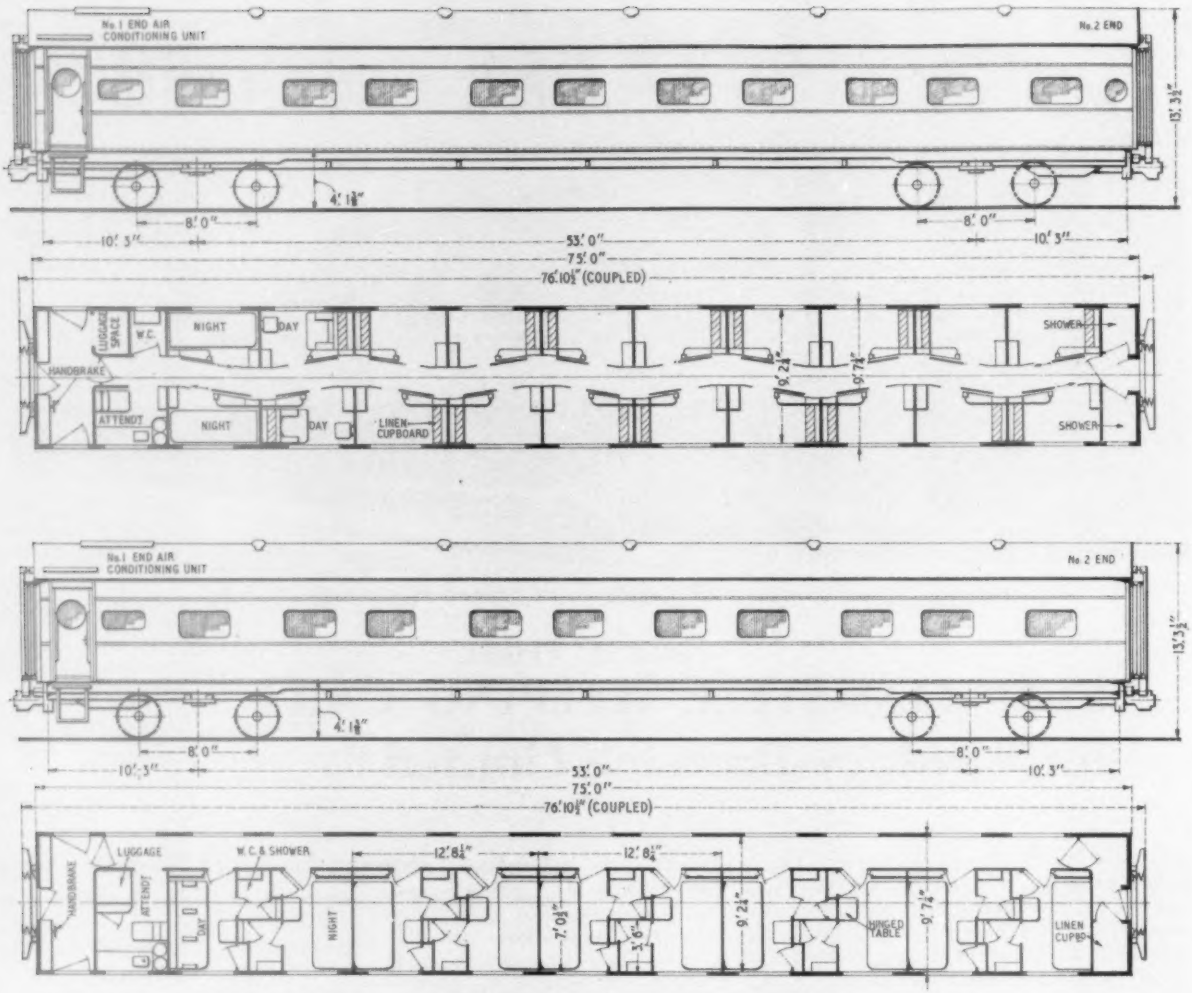
A folding wash-basin and toilet, two mirrors, fluorescent reading and room lights, shaver point, chilled-water tap, and other conveniences are also provided in each compartment. The berth is balanced to fold vertically into the transverse wall for day travel. Dunlopillo mattresses and multi-tone blankets are provided.

Alternate compartments have different colour schemes, and the whole is tastefully decorated and equipped. The staggering of the corridor is a clever device making possible the arrangement of the compartments with reasonable room to move about when the berths are lowered. At the far end of the corridor are two shower compartments one on each side.

The twinette cars are quite different. They have side corridors entered from a vestibule with more luggage space but no general toilet. As well as the attendant's accommodation there are facilities for him to prepare tea and clean shoes. Each two-berth compartment is entirely self-contained and provides dressing, shower and toilet facilities, and seating for three by day. At night the seat-back folds down forming the lower transverse berth. The upper berth folds down from being flush with the upper part of the wall and releases a built-in hinged ladder for the upper-berth passenger.

Fluorescent lighting

Fluorescent reading and room lighting, a full-length mirror on the compartment door, ladies' make-up mirror with special back-lighting, double wardrobe, iced water, folding tables, and shaver point are among the conveniences provided. Soft-blue night lights in the compartments and carpet lighting in the corridor are features. Opening off each compartment is a shower-toilet room with a composite folding basin-toilet unit and thermostatically - controlled hot and



Plan of twinette and roomette sleeping cars for "Sydney-Brisbane Limited" service

cold water supplies from 15 underfloor 20-gal. tanks.

The side windows are double with an adjustable venetian blind between the glasses. The outer pane is of tinted actinic glare- and heat-resisting glass and the inner one is of armour-plate glass.

These cars measure 75 ft. over headstocks and have a width of 9 ft. 7½ in. over corner pillars; the external appearance of both types is identical and they measure 53 ft. between centres of bogies. The cars now under construction for the standard-gauge service to Melbourne are generally similar to those now described but have slight modifications.

The remainder of the Limited stock consists of coaches released from the northern and north-western lines Daylight expresses in the form of two eight-coach sets.

LOADER AT PORT CARTIER, QUEBEC

In *The Railway Gazette* of August 25, 1961, the construction of the Quebec Cartier Mining Company's railway and harbour works at Port Cartier, on the Gulf of St. Lawrence, were described. On July 4 the s.s. *Ore Transport* took on a 49,000-ton cargo of iron ore at Port Cartier for Philadelphia and the mills of the United Steel Corporation.

The ore from the mine at Lac Jeannine was delivered by conveyors at the rate of 100 tons a minute to one of the largest loaders in the world. It can move itself 870 ft. along the dockside and 50 ft. at right-angles to it, and has an 85-ft. boom carrying an endless-chain type conveyor discharging the ore into the ship's hold at a rate of 5,000 tons an hour. An operator controls travel and the boom-conveyor operations from one of two cabs, as well as a built-in weighing mechanism. He presets the mechanism automatically to deliver the exact quantity of ore for each hatch as required. The loader was built by the Dominion Bridge Company and the electric controls by the Canadian Westinghouse Company. Other details of this large terminal operating equipment are given in the article describing the Port Cartier construction.

SOUTH AFRICAN RAILWAYS & HARBOURS VEHICLE ORDER

South African Railways & Harbours Administration has placed a repeat order with Leyland Albion (Africa) Limited for special six-wheel bus chassis, bringing the number of Leyland vehicles ordered by them during the past 15 months to 140 valued at over £480,000.

The new contract calls for Leyland Hippo 10-ton haulage truck chassis, which will be specially adapted for passenger-carrying, cross-country work, and will join the existing Railways' fleet of 475 Leyland Albion vehicles.

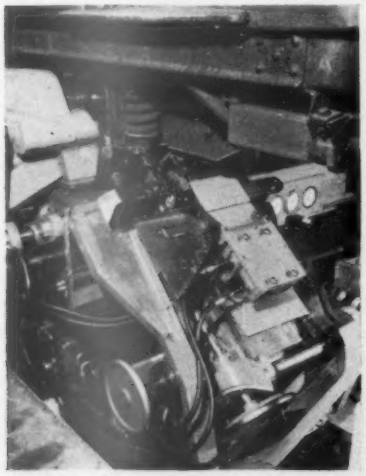
UNDERFLOOR WHEEL LATHE for London Transport

Machining of wheels on railway coaches carried out without removal from the vehicle

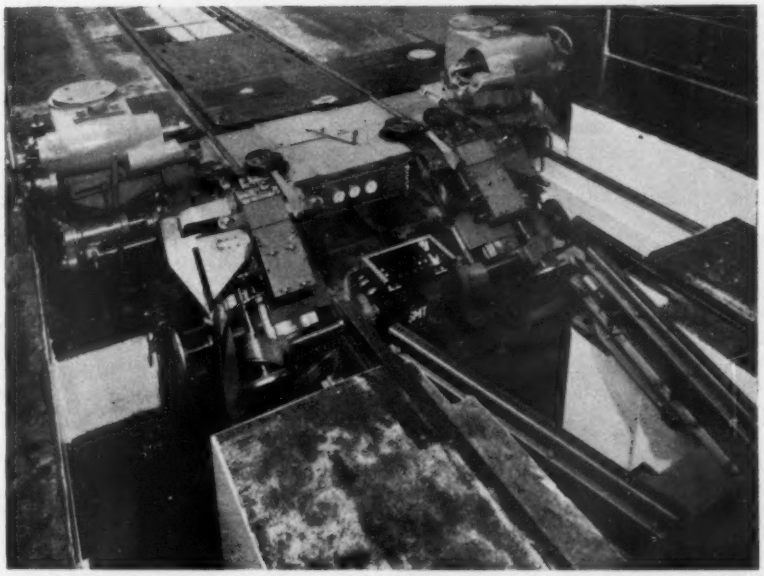
THE London Transport Executive has recently brought into use at its Northfields depot an underfloor lathe for machining railway wheels without removing them from the vehicle. It was designed and constructed by the Scottish Machine Tool Corporation Limited to London Transport specifications. Northfields is the main Piccadilly Line depot and deals with Tube-type stock. It is the third depot at which an underfloor lathe is installed. The first lathe, an experimental model, was installed at Golders Green depot in 1947, and the second at Neasden depot in 1956. These earlier lathes dealt with flanges only, the new lathe can machine the whole profile of the wheel.

Unnecessary to remove body

The improvements in design and construction embodied in modern Underground rolling-stock make it unnecessary for the vehicle body to be lifted from the bogies for maintenance purposes as frequently as was once the case, but there remains the periodical machining of wheels to restore their correct profile. If it is necessary for the body to be lifted for this purpose alone, the effect of the improvements in other directions, as far as saving of maintenance costs is concerned, is largely lost. The development of means by which wheel profiles can be effectively restored while the wheels remain in their normal running position is therefore of some importance and it is for this reason that London Transport has installed its new lathe.



Underfloor wheel lathe showing left-hand slide with tool in the operating position



Lathe in operating position, showing pressbutton controls, drive rollers, and tailstocks

In underfloor (or " pit " type) wheel lathes of earlier design, it has been usual for the vehicle wheels to be rotated by drive-rollers mounted on a horizontal axis parallel with that of the vehicle axle, the railway wheels resting on these rollers and the necessary adhesion being supplied by the vehicle's own weight applied through the axleboxes. This dependence on adhesion has involved limitation on the power which can be transmitted. In the new machine, the drive is applied to the wheels by two pairs of rollers on vertical axes. The rollers are pressed hydraulically against the inner and outer faces of each tyre. The two drive-rollers exert balanced forces on each wheel and no end thrust is applied to the axle.

Hydraulic jacks

During the machining process, the weight on the axle is relieved by hydraulic jacks, integral with the machine, which are applied to the undersides of the axleboxes, while concentricity is assured by mounting the axle between live centres which have power-operated movement for raising them into the working position and for lowering again to positions clear of the rails when the vehicle is to be moved over the machine.

The low-cost tool equipment was specially developed for the purpose and includes carbide " throw-away " tools, with clamp-type chip-breakers. The machine works on the copying-lathe principle, that is, the tool is moved by automatic hydraulic equipment across the wheel flange and tread, following a master profile.

Power-traverse movement

Quick power-traverse movement of the tool-slides in both directions is provided, with infinitely variable ranges of speeds and feeds. Operations are controlled from a bank of pushbuttons.

In operation, the axlebox covers on the axle bearing the wheels to be turned are first removed, with any shoegear, and other equipment mounted with them. The vehicle concerned, which normally forms part of a three-car or four-car unit and is not uncoupled for the purpose of machining the wheels, is drawn forward on to the lathe by means of a power winch

Continued on page 481

ELECTRIC ARC FURNACES AT CREWE WORKS in the London Midland Region

Steel foundry augmented by steel-melting shop designed to produce carbon and alloy

THE large steel foundry at Crewe Locomotive Works, which produces castings for the London Midland Region, and other Regions of British Railways, has recently been extended and modernised by the addition of a separate steel melting shop. This is equipped with two electric arc furnaces which replace two pulverised fuel-fired Sesci rotary furnaces and enable much cheaper grades of scrap to be used.

Supplied by Birlec-Efco (Melting) Limited, the furnaces are of the direct-arc tilting type, with eight-in. dia. automatically-adjusted vertical electrodes.

Each furnace, which has a shell diameter of 8 ft. and a molten metal capacity of 3½-4 tons of steel, is rated at 2,000 kVA. Designed for top charging, the furnace roof is slewed clear by a hydraulic ram to expose the hearth on which the charge is dropped from a charging skip.

Tilting mechanism

The shell is supported on rocker tracks, arranged for tilting up to 45 deg. forward for pouring and up to 15 deg. backward for removal of refining slags. Tilting is by a lead screw-and-nut mechanism driven by an electric motor. Each electrode is clamped in an arm fitted with a roller-bearing crosshead, arranged to move freely up and down the electrode mast. The electrode is clamped by springs contained in a pneumatically-operated cylinder. Water cooling is provided for the electrode arms, glands in the furnace roof, and the electrical connecting busbars. Movement of the electrodes to maintain the correct length of arc is by cable actuation from a winch motor. A counterbalance is fitted to reduce the power required for operation.

Amplidyne control gear

Automatic control of the winch motors is by a motor amplidyne set. This system provides each electrode winch motor with its own generator and allows it to respond to a control signal on the generator field. This signal is obtained by rectifying and comparing the arc voltage and current in a bridge circuit.

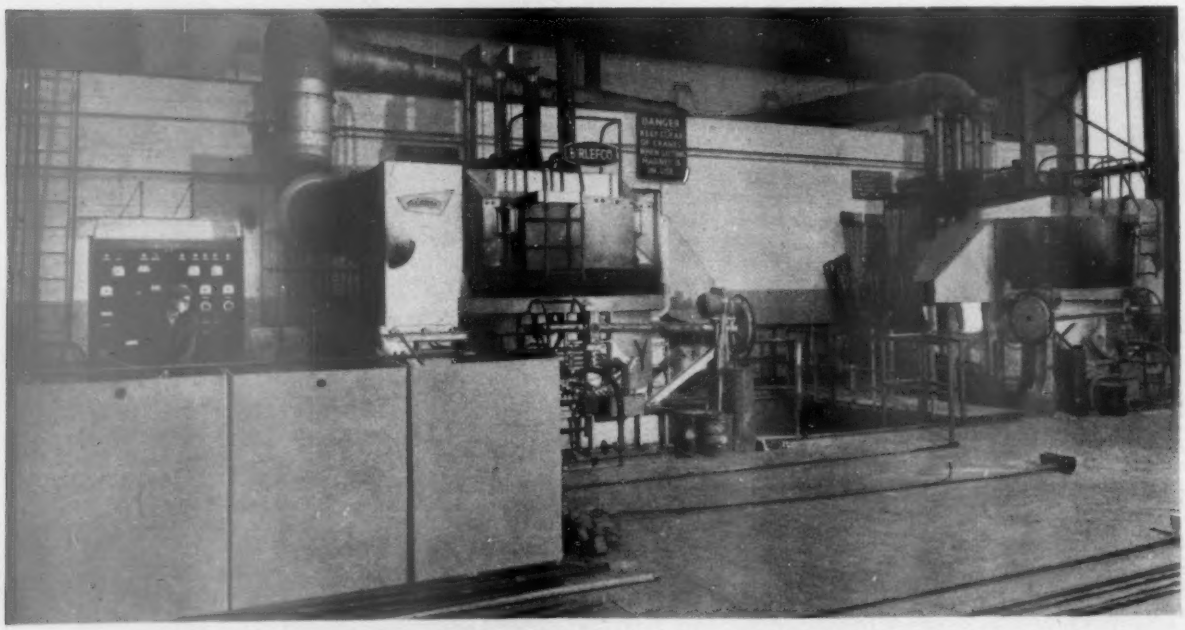
The furnace roof is swung clear of the shell for charging by a hydraulic ram which by a spiral groove and follower, is arranged to lift and swing the roof to one side.

Fumes and dust are extracted from the furnace top and ducted to a Tilghman automatic filter unit mounted outside the melting shop. Extraction is by a 14,000-cu. ft. per min. fan driven by a 35-h.p. electric motor. Fresh air is drawn into the duct for cooling and the dust is blown into a vertical bank of fabric filter tubes, the filtered air passing to atmosphere and the dust collecting on the inside of the tubes.

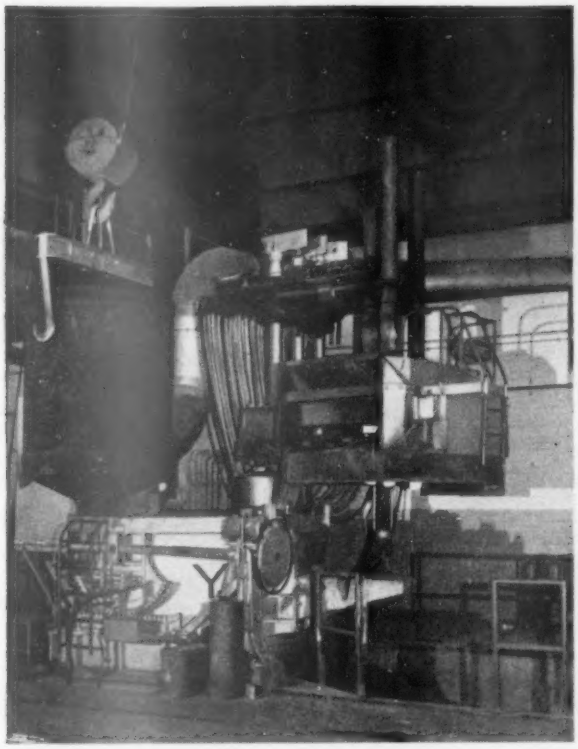
The top end of each tube is attached to a motor-driven eccentric shaking mechanism, the motor being switched on and off by a preset timer. This timer also controls isolating dampers for each filter unit. In accordance with the timing cycle, each isolating damper is closed in turn and the fabric tube vibrated by the shaker to deposit the dust in a collecting chamber in the base. The shaker is then switched off and the filter inlet damper opened.

Water cooling

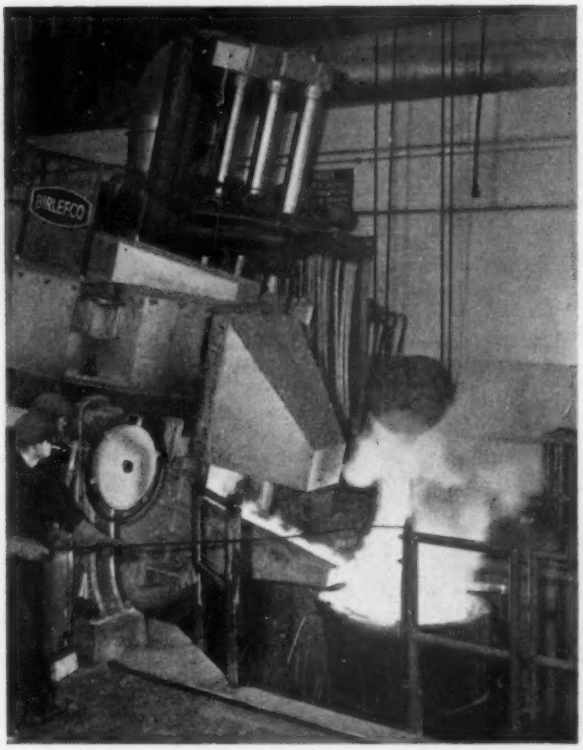
The furnace cooling water circulates at 80 gal. per min. in a closed circuit and is cooled in a Type P.68 Heenan water-cooler. This incorporates separate hot and cold water pumps and an axial-flow fan in the base which discharges a



General view of the electric-arc furnaces in Crewe Locomotive Works, British Railways, London Midland Region



Roof and electrodes swung clear for top charging



Furnace ladle tilted for pouring into ladle

vertical flow of air over the metal cooling screens. Working in conjunction with a heat-exchanger, this cooler is also used for controlling the temperature of the transformer oil.

Electrical control gear and instruments for the furnaces, water cooler, and dust extraction equipment are grouped on wall-mounted panels at the side of each furnace. The three-phase a.c. current is supplied at 6.6 kV. 50 cycles, and at 400V. for the auxiliary equipment. Two-stage overload and under-voltage protection is provided on the main H.T. circuit-breaker, which is of the oil-immersed triple-pole draw-out type.

Voltage control of the h.t. step-down transformer is by a motor-operated off-load tap changer, which allows the operator to regulate the furnace power output and arc length, during the heat. An illuminated indicator on the instrument panel shows the position of the tapping switch. The transformer is cooled by an externally mounted pump circulation oil/water heat exchanger. Stability of furnace operation and maximum power factor is obtained by the use of a special iron-cored reactor.

The charging skip, which stands on a weighing machine platform, is filled with scrap handled by an electro-magnet. Limestone chippings are added to the charge when this is lowered in the furnace. When the current is switched on, the three electrodes are lowered and controlled automatically to strike the arc and maintain this at the correct length. The whole charge is melted and a small quantity of iron ore and a quantity of limestone chippings introduced to produce an oxidising slag for the removal of phosphorus, silicon, and hydrogen. A sample is taken of the melt and the approximate amount of carbon determined. The bath is injected with gaseous oxygen, the duration of injection being calculated from the carbon figure obtained. The aim is to remove carbon by oxygen injection to 0.1 per cent below the figure ultimately required.

The bath is then slagged off and the reducing (de-oxidising) period begun by "blocking" with ferro-silicon, normally 56 lb. for a 4-ton charge. A second reducing and refining slag is then put on comprising 1 cwt. limestone chippings, 28 lb. fluorspar and 28 lb. anthracite. Further bath samples are taken to obtain the carbon and manganese figures, and from these the final additions of ferro-manganese, silicon-manganese, and hematite pig-iron are calculated to meet the required steel specification. The metal temperature is adjusted with the electric arc to give a tapping temperature of 1,660 deg. C., the bath temperature being obtained by an immersion-type thermo-couple and a quick-acting indicator. Seven pounds of aluminium ingot are added when the metal is tapped into the ladle.

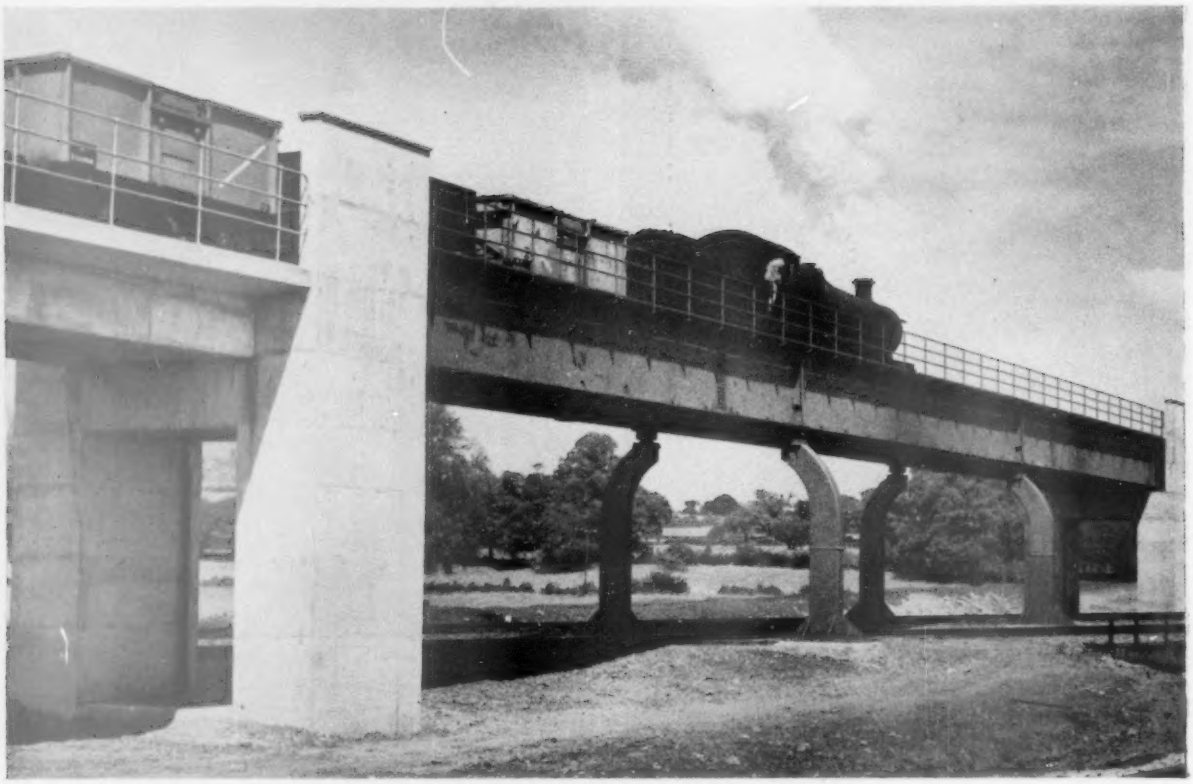
Underfloor wheel lathe for London Transport

(*Concluded from page* 479)

until the axle concerned is correctly positioned. Precise location is assisted by the provision of recesses in the railheads at the appropriate position.

The tailstocks are then swung into position and locked, and the running centres are raised electrically, in combination, to a level slightly above the centre-line of the axle. The hydraulic jacks are then engaged with the bottoms of the axleboxes and by this mean the axleboxes are raised until the axle centres are in line with the tailstock running-centres, which are then engaged with the axles and locked. Swing rails, used to bridge the operating position while train movements take place, are then moved clear and the tool-slides are traversed hydraulically to the operating position and locked. The driving rollers are applied hydraulically and the cutting tools are raised by means of electricity to the operating position.

After the completion of the machining process, the reverse sequence is employed to disengage the machine and so to allow the vehicles to be drawn forward to bring into position the next pair of wheels to be machined.



The flyover bridge at Bishton on British Railways, Western Region

WELDED STEEL BRIDGE CONSTRUCTION, British Railways, Western Region

Three examples of the logical development of underline-welded plate-girder bridges

THE new flyover bridge at Bishton and the reconstruction of Victoria Street, Bristol, and Bradford-on-Avon bridges together feature modern practice in the form of continuous girders, piggy-back bearings and portal frames in prefabricated steel girder work, resulting in greater economy, centralised reactions on pier cylinders, and improved appearance.

That the logical development of the underline-welded plate-girder bridge is simplicity in every aspect from drawing-board to future maintenance is shown by three examples of recent bridge constructions described in the July issue of the Western Region Civil Engineering Department Bulletin.

The Bishton flyover bridge carries the Up relief line over the main lines near Magor, and was referred to in the description of the modernisation of track layout and signalling between Severn Tunnel Junction and Newport, in *The Railway Gazette* of July 7 this year. The three half-through type square spans comprise two continuous plate girders 185 ft. long carrying a floor of cross girders and jack arches and a single ballasted cross-sleeper track.

At the intermediate points of support the main girders rest on spherical bearings on the tops of columns founded clear of the main-line tracks and curved inward to give support directly below the main girders. These are spaced at the minimum centres needed to clear the structure gauge of the line on the bridge. At these points, the cross girders complete the inverted U-shaped portal frames formed with the columns.

By this means, three main advantages have been secured: (1) a crossing at an acute angle of skew has been achieved with a bridge of square spans, (2) the high deformation stresses inseparable from the floor-to-main girder connections in skew spans have been avoided, and (3) the construction depth has been kept to a reasonable minimum. This latter is the most important requirement of a flyover bridge where the height through which every train must be lifted dictates the lengths of the approach inclines in the first place, and is a vital factor in the economics of train operation. Moreover, the full benefits of girder continuity and of an uninterrupted floor system have been achieved, and the width of the superstructure has been made as narrow, and therefore as economical, as possible.

The girders are fixed at the step bearings on the Newport abutment and are free to slide on the lubricated step bearings at the other abutment. At the intermediate supports the bearings are self-lubricating and consist of inverted leaded

(Left): erecting girders with the aid of road cranes, for the Bishton flyover bridge.
(Right): temporary struts between the columns pending the erection of cross girders

phosphor-bronze cups resting on steel spheres. In addition to forming knuckles in the portal frames, these spherical bearings provide lateral restrain to the superstructure while allowing the main girders freedom to rotate in the vertical planes. Longitudinal movement of the girders at these intermediate supports due to thermal expansion and contraction is taken care of through the rotational flexing of the specially curved welded box-section columns.

Steelwork

There are 90 tons of steelwork in the bridge and columns. Each girder has two field joints completed on site with Torshear bolts. The cross girders complete with concrete skewbacks cast on in the shops are seated on shear plates on the sloping flanges of T-shaped stiffeners, and the joints are completed with high-strength friction-grip bolts. The *in situ* concrete fill cast on top of the precast concrete jack-arch units is laid to fall and waterproofed overall. The concrete work is kept clear of the main girders, and where the webs and flanges of the cross girders emerge from the concrete cover, baffle stiffeners are designed to prevent the ingress of moisture between the concrete and the steel. The undersides of the bottom flanges are not covered.

During erection, temporary steel struts were used to hold the columns and to brace the main girders until the special cross girders could be fitted to complete the portal frames. A notable feature of the erection was the use of the contractor's 25-ton and 10-ton road cranes. A carpet of timbering laid between the rails on the main lines enabled the two machines to operate more rapidly and with greater flexibility than would have been the case with rail-mounted breakdown cranes. So effective were these road cranes that the number of week-end occupations programmed when rail-mounted cranes were expected to be used was cut from three to two.

Victoria Street Bridge

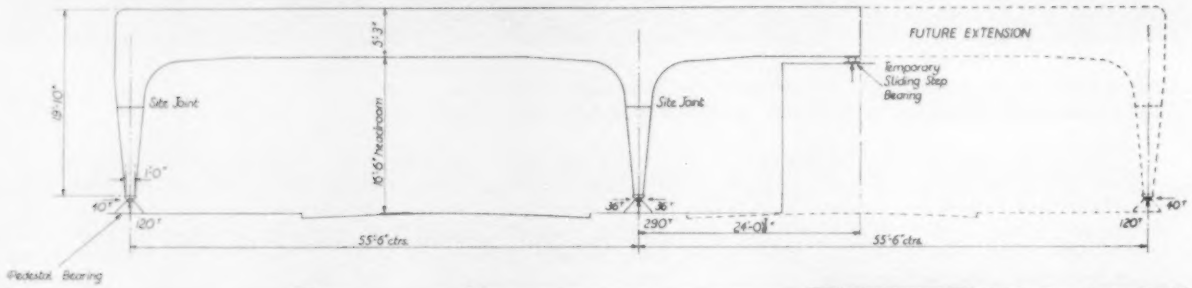
Victoria Street Bridge carries three tracks of the harbour lines over a busy thoroughfare in Bristol. The original bridge built in 1870 had three spans. The central one, 43 ft. long, spanned the street and was carried on cast-iron columns adjacent to the kerbs, and two 11-ft. flanking spans passed over the footwalks This structure of riveted wrought-iron plate girders, cross girders and stringers had a timber deck and was built to acrry broad-gauge tracks; for some time it was used for mixed gauges. The first stage of the reconstruction completed in 1961 provides for future road widening when there will be two roadways 30 ft. wide, two footwalks, and a central reservation of 10 ft. Rail level has been lifted 16 in. and the clear headroom below the bridge has been increased from 15 ft. 8 in. to 16 ft. 6 in.

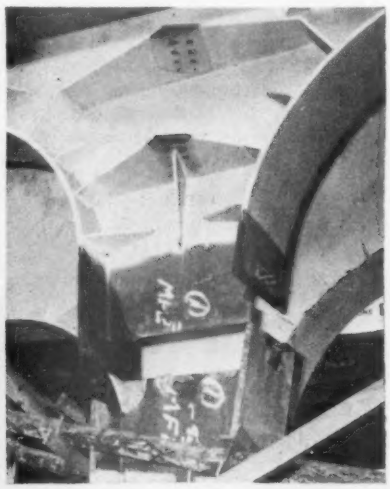
Portal-frame construction

The portal-frame construction was chosen to obtain the full benefit from the continuity of the welded plate girders and to meet the wishes of the city engineer, who had asked for a welded steel bridge giving an appearance of smooth clean lines unimpaired by bolt heads and stiffeners. There are four welded plate-girder portals, and the decking is of the Western Region standard prefabricated and waterproofed welded steel units resting on shear plates on the sloping flanges of tee-shaped stiffeners welded to the main girders. The site joints between floor units and main girders are completed with high-strength friction-grip bolts designed to carry the end fixing moment stresses. Ballasted cross-sleeper permanent way is provided.

The main girders, designed for future lengthening and delivered in sections 82 ft. long and weighing 15 tons, were prepared for connecting to the portal

(Above): the bridge over Victoria Street, Bristol; (below): diagram of main frame of bridge

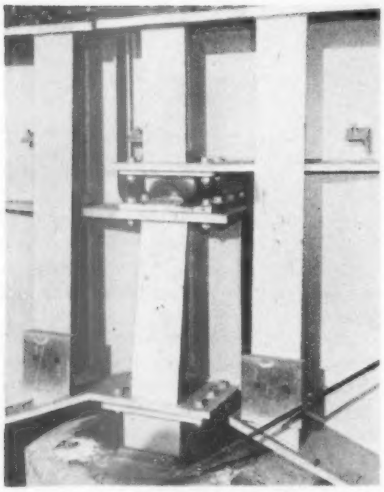




(Above): bringing girder in contact with portal leg before site-welding

(Left): girder erection with road cranes

River Avon bridge at Bradford-on-Avon with new main girders in position



Erection of prefabricated floor unit at Bradford-on-Avon

legs temporarily by bolting and permanently by electric arc welding on site. Delivered by rail, all the prefabricated girder work was erected by road cranes. The site welds, completed after the road had been re-opened to traffic, were checked by radiographic examination.

Girders

The portals are supported on spheroidal graphite cast-iron knuckle bearings. The ends of the girders, designed to receive extensions when the road is widened, temporarily rest on sliding step bearings on top of the old abutment. Pending completion of the second half of the bridge, the continuity of the main girders would have resulted in an uplift on the abutment under certain conditions of loading. To obviate this, the intermediate knuckle bearings were set initially at a low level and only after full dead load had been applied were they jacked up to bring the knuckles into full contact.

There are 135 tons of steelwork in the new bridge. A notable feature of the actual reconstruction was the use of the contractor's 25-ton road cranes which clipped many hours off the time which would have been required using rail-mounted cranes.

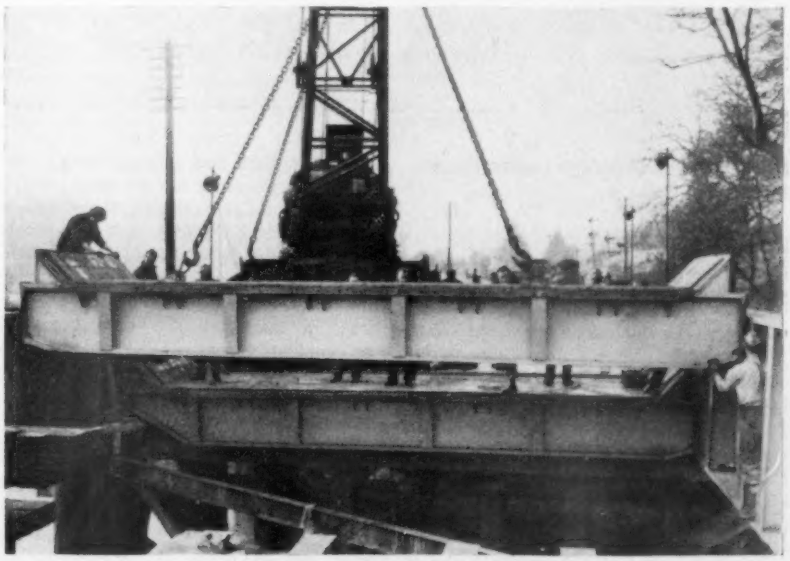
Avon bridge, Bradford-on-Avon

The River Avon bridge at the Bath end of Bradford-on-Avon Station is a double-track four-span plate-girder bridge dating from 1889. Each span, 58 ft. long and of right-hand skew, has two main girders supported on cast-iron cylinder piers only 4 ft. in diameter. The bridge is of the half-through type construction and the superstructure, taken out of use in 1960, was of riveted wrought iron with cross girders, rail bearers and a timber deck.

Temporary spans

Reconstruction involved the building of four 30-ft. temporary spans supported on clusters of timber piles in the river and the erection of timber waybeams carried on bents of military trestling at each end. The tracks were transferred to this 260-ft. long temporary bridge as the deck of the old superstructure was gradually taken away. This was followed by the removal of the main girders,

Continued on page 486



Piggy-back girder bearings centralising reaction on pier

MOTOR LUGGAGE VANS for the Eastern Region

Vehicle designed to handle newspapers and parcels with floor drains for wet-fish traffic

NINE additional four-car units are being built by British Railways at York to augment the rolling-stock for the London, Tilbury & Southend line of the Eastern Region of British Railways. These comprise three normal trailing vehicles, and a motor luggage vehicle.

Designed to cope with newspaper and parcels traffic, these coaches have bogies, underframes, and traction gear identical to current a.c. English Electric stock. The only detail difference, apart from the luggage compartment occupying all the passenger space, is the slight rearrangement of the guards compartment, which, as is usual, accommodates some of the low tension and auxiliary equipment.

Motor luggage van built at York for British Railways, Eastern Region

Guard's and luggage compartments

The introduction of a hinged door between the guard's compartment and luggage compartment has necessitated the removal of the conservator cupboard and the construction of a differently shaped conservator in the remaining cupboard room. Thus the space behind the guard's table is deeper than normal and extends into the luggage compartment. A communicating door is level with the back of this protrusion, a short corridor being formed beside the conservator and guard's desk. A single window is sited in this corridor.

The luggage compartment is 50 ft. 3¼ in. long into the recess, where a dog ring is sited, behind the low tension cupboard.

Two outward-opening double doors each side give access to the luggage compartment. One pair is 13 ft. 2 in. from the end; the second pair is 25 ft. from the first. Between these doors, on each wall, are three hinged shelves 6 ft. 6 in. x 2 ft. 6 in., which fold down when out of use. A shelf is fitted on each side between the second doors and the guard's van.

Aluminium covered cable duct

Aluminium floor plates cover a central longitudinal cable duct, hardwood being used elsewhere.

At the far end of the vehicle, a full-width aluminium tray with two floor drains extends 4 ft. along the floor to take wet fish. Between this and the first doors three cycle hooks are fitted to the roof. A single tip-up seat is wall mounted opposite these hooks.

Sixteen tungsten ceiling lights and one bulkhead fitting provide light in the luggage compartment, and two rows of ceiling-mounted tubular heaters give a total heating capacity of 8kW. A window is provided over each shelf and one each side over the fish tray.

All luggage compartment doors have mortice locks and security chains, the door windows have steel-mesh protection, with four bars fitted behind each bodyside window. Sliding vents are fitted to these windows.

Small destination boards are provided for external mounting.

Welded-steel bridge construction

(*Concluded from page* 485)

each of which had a separate bearing on a common bedplate on the top of each pier cylinder. This arrangement had produced a considerable eccentricity of loading on the cylinders and the foundations.

In the new superstructure, this eccentricity has been entirely eliminated by the use of piggy-back bearings whereby the adjacent ends of the main girders are both located exactly over the centre line of the cylinder, one girder bearing on the pier and the other over-riding the first girder.

The new girder work, 310 tons in all, is of all-welded shop construction with the floor units prefabricated and waterproofed before they left the shops, resting on shear plates on the sloping flanges of stiffeners on the main girders, and the joints completed with high-strength, friction-grip bolts. This is in accordance with Western Region standard practice but, in this particular case, the units span right across under both tracks. At the Bradford end, where the bridge fans out to accommodate a turn-out leading to the goods yard, these units are nearly 37 ft. long and weigh over 14 tons.

All three bridges were built in accordance with the requirements of the Chief Civil Engineer at Paddington, and the steelwork was fabricated by the Fairfield Shipbuilding & Engineering Co. Ltd., of Chepstow, Monmouthshire, which also erected the girders at Bishton and Bristol. The Bradford-on-Avon bridge was erected by direct labour under the District Engineer, Bristol, British Railways, Western Region.

SPEED TEST ON S.N.C.F.

An experimental French train drawn by an electric locomotive reached a speed of 220 k.p.h. (136.7 m.p.h.) over a 15-km. stretch of track near Mulhouse on a trial run on October 24. The speed test was made to provide technicians of the Société des Chemins de Fer Français with information on the stability of the tracks and of the overhead electric wire.

PERSONAL

British Transport Commission

MR. J. O'NEILL, Chief Paper & Printing Officer, British Transport Commission, is to vacate this position in December, before formally retiring in March, 1962.

British Railways

MR. S. H. GOULD, Operating Officer, British Railways, London Midland Region, who has been appointed Movement Officer,

Mr. S. H. Gould

Euston, began his railway career on the former London & North Western Railway at Watford, in 1917. After service with H.M. Forces during the 1914-18 war he rejoined the railway service. In 1924 he was attached to the staff of the Chief General Superintendent, L.M.S.R., and held positions at Lancaster and Preston. Two years later he joined the District Controller's staff at Birmingham and, in 1929, became Assistant District Controller, Nuneaton. After holding similar positions at Patricroft and Willesden in 1930 and 1931 respectively, Mr. Gould took charge of the Euston sub-office of the Divisional Superintendent of Operation (Western Division) in 1934. He became Assistant Divisional Controller (Passenger Services), Crewe, in 1936 and after three years in that position, was appointed Divisional Controller, Crewe. Mr. Gould became Chief of Divisional Trains Office, Crewe, in 1944, was appointed Assistant, Passenger Services, Chief Operating Manager's Office in 1946, and redesignated Assistant (Passenger Services). He became Assistant Operating Superintendent in 1954 and subsequently Operating Officer.

MR. D. M. HOWES, Assistant (Freight Services), Euston, British Railways, London Midland

Mr. D. M. Howes

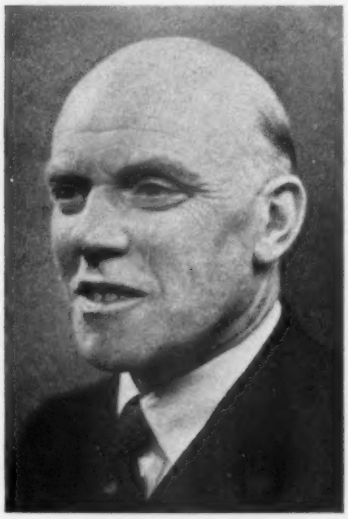
Region, who has been appointed Assistant (Movements), began his railway career with the former London Midland & Scottish Railway, in 1935. Three years later, after gaining experience in goods and passenger work, he was appointed a traffic apprentice and continued training until joining H.M. Forces in 1939. During the war Mr. Howes served in Movement Control with the British Expeditionary Force and later in Sicily, Italy and Austria, attaining the rank of Lieutenant-Colonel. On returning to railway service in 1946 he was appointed Yardmaster, Stafford, and, successively, Assistant to District Operating Superintendent at Nottingham, 1947; London (Western), 1950, and Birmingham (Midland) in 1951. In 1953 he became Divisional Controller Freight Services, Derby, and, in 1955, Assistant to the Chief Operating Superintendent, Scottish Region. He was appointed Assistant (Freight Services) in 1957, the position he now vacates.

MR. M. E. WOODS, Assistant District Operating Superintendent, Edinburgh, British Railways, Scottish Region, has been appointed District Operating Superintendent, Burntisland.

MR. D. M. WHITBREAD, Assistant (General), Running & Maintenance Headquarters, Glasgow, British Railways, Scottish Region, has been appointed Running & Maintenance Engineer, Inverness.

MR. D. HALLYBURTON, Head of Central Timing & Diagramming Section (Great Northern), Liverpool Street, British Railways, Eastern Region, has been appointed Trains Assistant, General Manager's Office.

MR. A. J. JOHNSON, M.INST.T., Commercial Officer (Acting), British Railways, London Midland Region, who has been appointed Commercial Officer, was educated at Stand Grammar School, Manchester, and St. Catharine's College, Cambridge. He joined the former London & North Eastern Railway as a traffic apprentice in 1928 and, after training in commercial and operating work, gained experience in the Chief General Manager's Office, Kings Cross. He subsequently held positions at Newcastle, Sunderland, Hull, and York. Mr. Johnson became Goods Agent, Hull, in 1939 and returned to Sunderland in 1945 as Acting District Superintendent. Later that year he became



Mr. A. J. Johnson

District Passenger Manager, Leeds, and, in 1949, District Commercial Superintendent, Cambridge. He was appointed District Commercial Superintendent, Stoke-on-Trent, in 1954. He was appointed Assistant Commercial Officer in 1957, and subsequently became Commercial Officer (Acting).

MR. J. COWING, Chief Assistant (Freight) to the Commercial Officer, Euston, British Railways, London Midland Region, who has been appointed Assistant (Commercial) Euston, entered the service of the North Eastern Railway at Consett in 1915 as a junior clerk. For nine years he served at various stations in the Newcastle district, except for a period during the 1914-1918 war when he joined the R.F.C. (later R.A.F.) and became a seaplane pilot, seeing service in France and home waters. In 1924 Mr. Cowing was selected for work at the York Headquarters in connection with the revision of rates arising out of the Railways Act, 1921, and in 1928 he entered the Rates Office of the Goods Manager at York and held several posts there. He left the North Eastern Area in 1937 on promotion to a senior position in the Rates & Charges Section of the Goods Manager's Office, Southern Area, L.N.E.R.,

Mr. J. Cowing

Kings Cross, and progressed through this office, occupying several posts including those of Deputy Chief Assistant and Chief Assistant. In March, 1948, Mr. Cowing was appointed Assistant Commercial Superintendent (Rates & Charges—Goods), Eastern Region, and in 1951 became Assistant to the Commercial Superintendent (Freight Rates & Charges), Euston, and subsequently Chief Assistant (Freight) to the Commercial Officer.

MR. F. D. PATTISSON, A.M.INST.T., Assistant (Research), Traffic Headquarters, British Railways, Western Region, who has been appointed District Traffic Superintendent, Birmingham, was educated at Radley College and began his railway career with the former Great Western Railway in 1941. He served with H.M. Forces during the war. In 1947, after resuming his railway career, he took the G.W.R. three-year course of training. From 1950 to 1952 he was engaged on various special duties in the Worcester, Oswestry, Chester, and Cardiff District Offices. In 1952 he became Assistant to the District Operating Superintendent, Paddington, and in 1955, Head of the Research Section, Operating Superintendent's Office. In 1957 he became Assistant (Dieselisation & Research) and in 1960, Assistant (Research) at Traffic Headquarters.

Mr. F. D Pattisson

Overseas

MR. J. A. HEATH, Assistant Chief Mechanical Engineer, Commonwealth Government Railways, who has been acting as Chief Mechanical Engineer and who has now been appointed to that position, was previously employed with the New South Wales Railways for 22 years where he served his apprenticeship as a fitter, turner and toolmaker. He subsequently obtained a Diploma of Mechanical Engineering and was appointed to the New South Wales Railways Design Staff. In 1942, Mr. Heath was transferred to the Tank Assembly Workshops as Tooling Engineer and was later appointed Production Engineer. After the war he transferred to the Locomotive Workshops Production Office and in 1951 resigned from the N.S.W.R. to take up an appointment with the Commonwealth Government Railways as Assistant Chief Mechanical Engineer.

Mr. J. A. Heath

MR. G. M. COLEMAN, Sales Promotional Manager, Canadian National Hostels, has been appointed Manager of Sales.

MR. D. GORDON, President, Canadian National Railway, has had his term of office extended until September 30, 1963.

MR. T. H. JENKINS, Chief Engineer of Railway Construction, Victorian Government Railways, has retired.

MR. C. A. CLOUGH, Diesel & Electrical Engineer, Commonwealth Government Railways, who has been appointed Assistant Chief Mechanical Engineer, joined the Western Australian Government Railways in 1932, and served his apprenticeship in electrical fitting. He became an Associate in Electrical Engineering in 1940, and was appointed Assistant to the Mechanical Inspector of the system. From 1941 to 1944 Mr. Clough served as the Commissioner's representative on the Apprentice Board and Departmental Examiner for the Metal Trades Apprentices. He resigned from the W.A.G.R. in 1945 to become the Electrical Engineer with Commonwealth Government Railways. He was appointed Diesel & Electrical Engineer in 1951.

Mr. C. A. Clough

Industrial

MR. E. W. SENIOR has been appointed the Director of the British Iron & Steel Federation. MR. J. B. COWPER has been appointed Managing Director of British Iron & Steel Corporation. MR. J. DRISCOLL is to be Assistant Director (Economics); MR. L. J. GOLLOP is to be Assistant Director (Statistics); MR. B. S. KEELING is to be Assistant Director (Training); MR. A. H. MORTIMER is to be Assistant Director (Commercial); and MR. DONOHUE to be Secretary of the Federation.

Institution of Railway Signal Engineers

The following names have been entered on, or transferred in, the Register of Members.

Associates

MR. F. W. MARTIN, S.G.E. Signals Limited.

MR. E. L. AKEYLE, Railway & General Engineering Co. Ltd.

MR. R. G. GROUT, Western Industries (Pty.) Ltd., South Africa.

Transfer from Associate Member to Member

MR. J. H. LETHBRIDGE, Westinghouse Brake & Signal Co. Ltd.

MR. W. DEAN, Chief Signal & Telecommunications Engineer's Department, British Railways, Scottish Region.

Obituary

We regret to record the death on October 16 of MRS. M. E. TRIST, Chairman, Transport Brakes Limited.

NEW EQUIPMENT *and Processes*

CABLE AND PIPE LOCATOR

A fully-transistorised locator for tracing buried or otherwise invisible pipes, cables, and other metallic conduits is available. Its three units—oscillator, receiver, and search coil and earphones—are illustrated on this page. The oscillator is attached to one end of underground pipes or cables which are " dead " electrically, and the receiver unit will respond orally in the earphones and visually on the meter, when the search coil is adjacent to the pipe or cable. Cables insulated from earth should be grounded before the search is made.

The apparatus can also be used on energised cables without the oscillator unit, as the receiver unit will detect the 50-cycle radiations of the cable itself.

The unit is built for field use, is light to handle, and complete with built-in batteries.

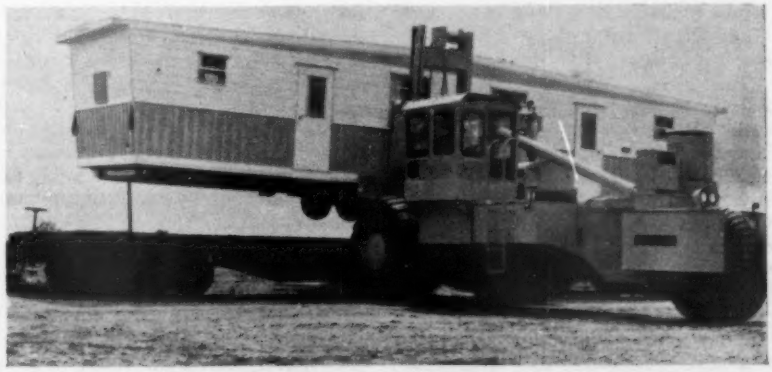
Further details can be obtained from the manufacturers, Metal Detection Limited, Bickford Road, Witton, Birmingham, 6.

20-TON FORK LIFT TRUCK

The FLT-20 fork lift truck is an addition to the Le Tourneau range of high-capacity vehicles. The machine has been designed to handle heavy material of the type normally handled by cranes. The illustrated application shows the vehicle loading a mobile three-bedroom house on a railway flat car at the manufacturer's works.

The truck has a capacity of 40,000 lb. and can be operated off the hard standing for site work. It has a length of 34 ft. 9 in., a width of 12 ft. 2 in., and a height of 16 ft. 4 in. Capacity lift is available at a 48-in. load centre, and turning radius is 23 ft. approximately. The forks have a length of 8 ft. and width of 10 in. They are spaced at 9 ft. Travelling speed is stepless from 0 to 11 m.p.h. The weight of vehicle is 5,500 lb. Power is supplied by a 210-h.p. diesel engine direct-coupled to a d.c. generator and an a.c. generator made by the Le Tourneau company. Each front wheel is separately operated by a d.c. motor and reduction gear. A.c. motors are used for the power applications individually. Regenerative and electromagnetic brakes are provided, the electromagnetic brakes operating multiple discs on the powered wheels for parking and emergency stops. Steering is from the rear wheel which is not power-operated. All controls are by electric switches mounted in a console directly in front of the driving seat which rotates with the fork head.

Further details can be obtained from R.G. Le Tourneau Incorporated, Longview, Texas, U.S.A.



REPAIRING TRACTION MOTORS

Tungsten inert gas welding has been developed for the connection of armature coil lead and commutator riser in the repair of traction motors for heavy diesel-electric locomotives.

This joint has long been the weak spot in the armature of nearly all electric motors, being awkwardly placed and exposed to mechanical damage as well as subject to heavy current loading and continuous heating from its proximity to the brush gear. The idea of superseding the soldered joint, especially in high-current traction motors, will therefore improve the reliability of the armature and its carrying capacity especially under momentary overloads.

The use of tungsten inert gas welding will result in a joint which is all copper and has no sudden change of effective current-carrying capacity, often a source of breakdown in the armature. It also ensures that the entire armature can sustain the high temperatures now required, especially where fibreglass insulation is used. It also provides greater mechanical strength in this vulnerable spot.

The process is used for many of the alloy welding processes in use today—especially for aluminium—and the necessary equipment is likely to be available in many repair shops.

Further details can be obtained from the General Electric Company, Schenectady, N.Y., U.S.A.

TRANSISTORISED WELDING

timers

Two fully-transistorised timing devices have been provided for use with spot welding guns. The Mark II has a 210-250-V. input, is designed for 30A. line current, is initiated by closure of low

voltage contracts in the microswitch, and has an accuracy of ± one cycle with a ± 10 per cent mains variation.

The Mark IV has a 240-415-V. input, is designed for 100-A. line current, is initiated in a similar manner, and has an accuracy of ± one cycle, or 1 per cent, whichever is the less, independent of a mains variation up to ±6 per cent. The time cycle of both timers is from two to 50 cycles. It is determined by the discharge of a low loss storage capacitor into the base of a switching transistor. A variable resistor determines the duration of the current discharge. Both timers have sockets to take plugs on the floating lead from the welding gun.

Further details can be obtained from Portable Welders Limited, Castle Mills, Buckingham, Buckinghamshire.

ENGINE CLEANING SYSTEM

A bath treatment for cleaning external and internal parts of engines has been developed under which parts need not be handled during cleaning. Components are lowered into the tank in a basket and, on removal, are hosed down with water. This first treatment takes from 2 to 4 hr. according to the degree of dirt to be removed.

If carbon deposits remain on the parts, they can be immersed again for from ½ hr. to 2 hr. in a second tank, after which they are further hosed down with water. If rust or other corrosion has to be removed, immersion is needed in a third tank containing dilute solution of Bisco corrosion remover, followed by hosing. As a final operation, all parts are immersed in a fourth tank containing a fluid, which removes all water and replaces it with a corrosion protective film. Parts are then allowed to drain before storing.

A series of rust preventatives applied by conventional means has also been developed.

Further details can be obtained from K. Allan & Co. Ltd., Alanzol Refinery, Bream, near Lydney, Gloucestershire.

NEW SOUND LEVEL INDICATOR

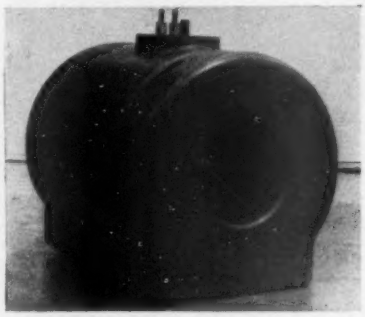
A new model sound level indicator is now available from Dawe Instruments Limited, to provide quick and reliable readings of noise.

This Type 1408D fully transistorised instrument measures only 6 x 3 x 2¼ in. and weighs 14 oz. complete with dry batteries, which have an operating life of 80 hrs. The range of the instrument is from 64 to 110 dB, adequate to deal with most general and industrial applications. The built-in Rochelle-salt crystal microphone remains unaffected over the temperature range 0–45 deg. C. (32-113 deg. F.). Despite its small size the indicator complies fully with the proposed specifications of the International Electrotechnical Commission in having three filter networks, which give it a frequency response similar to that of the average human ear at different noise levels. The indicator is housed in a tough plastic casing and is supplied with a leather carrying case with shoulder strap.

Further details can be obtained from Dawe Instruments Limited, Western Avenue, W.3.

ENCAPSULATED CURRENT *transformer*

A current transformer for use on high-speed electric trains operating on the Eastern Region of British Railways from Liverpool Street to Clacton has been encapsulated by a process using epoxy resin. After casting, the moulding



holes were plugged under vacuum to ensure complete sealing. The transformer will be mounted under the train, on the underframe of the motor coach without any additional protection, either against stones or against weathering or moisture.

Further details can be obtained from the supplier of the moulds, Permali Limited, Bristol Road, Gloucester.

VOLT-WATT-METER

The Robinair P.8006 Type 4 volt-watt meter is a multi-purpose instrument primarily designed for the measurement of fractional horse-power motors. The instrument provides three facilities: a.c. voltage, measurement 150-250, wattage measurement in ranges 0-250, and 0-750 watts with x 10 scaling, and continuity test by means of a battery-operated buzzer. The instrument is housed in a wood case and is supplied complete with all necessary test and connector leads. The voltmeter is designed specifically for the measurement of a.c. mains voltages in the range of 180-250 V. The meter has a relatively low input resistance and it should, therefore not be used for purposes other than for which it was designed. The continuity tester provides a convenient method of checking continuity in fuses, leads and low resistance windings. By using a buzzer to provide an audible signal it is particularly suitable for obtaining continuity checks in locations where it would not normally be convenient to observe an instrument scale.

The wattmeter operates in a somewhat different manner to conventional instruments, but allows for power factor and thus provides true wattage readings over the range for which it is calibrated. Ranges of 0-250 W. and 0-750 W. are provided. A multiplier switch is incorporated and this increases the scale readings ten times. This toggle switch is biased into the x 10 position so that in measuring motor leads the start surge power is always obtained. The running power is then obtained simply by holding the switch over into the x 1 position. The circuit is phase-sensitive and thus true watts are indicated. The instrument is provided complete with a 3-core heavy duty cable, approximately 5 ft. in length. The instrument is contained in a wood case 9¾ in. long x 7 in. wide x 3¾ in. high. Its weight is 4¼ lb.

Further information can be obtained from J. W. Pickavant & Co. Ltd., Apkoway Works, Bow Street, Birmingham, 1.

OIL-FIRED HEATER

The Econoil X19 and X24 oil-fired heater is designed to provide efficient industrial low-cost space heating. A lightweight construction is used which allows easy roof mounting, thus freeing floor space for machines and operatives and providing even warm-air distribution. The heater units can be used with single diffusers or, in conjunction with ductwork having multiple outlets, as a general heating system for a wider area. They can be automatically operated by time clock in accordance with working hours, and are designed to provide quick warmth, within minutes of switching on. A mobile version is available for use where local warmth is required in one part of a large building or for emergency use. Heat outputs offered are 150,000-250,000 and 380,000 B.t.u. per hr.

Further details can be obtained from Nu-Way Heating Plants Limited, Econoil Division, Droitwich, Worcestershire.

STANDARDISED DRAWING *storage units*

A new range of Ranplan drawing storage steel cabinets offers standardised units with 14 trays 1 in. deep, with a height of 22 in. and variable width, and back-to-front dimensions.

The trays can be supplied sub-divided into compartments providing two or four divisions to accommodate smaller size drawings, thus avoiding the misplacement of small drawings interleaved with larger sizes.

Further information can be obtained from J. H. Randall & Son Ltd., Paddington Green Works, London, W.2.

Ministry of Transport Accident Report

Derailment between Holmes Chapel and Sandbach, British Railways, London Midland Region, on February 14, 1961

Colonel J. R. H. Robertson, Inspecting Officer of Railways, Ministry of Transport, inquired into the high speed derailment of a fully fitted parcels train from Manchester to Crewe, at about 4.9 p.m. on February 14, 1961, between Holmes Chapel and Sandbach on the Up main line. One pair of wheels under a covered goods wagon with a 10 ft. wheelbase became derailed about 60 yd. to the south of Holmes Chapel Station, when the train was travelling well in excess of 60 m.p.h. The other pair of wheels became derailed almost immediately, but the van remained upright and in line, and the train ran on for some 3½ miles until the van's derailed wheels struck the lead of the facing cross-over approaching Sandbach Station. Other vehicles in its rear were derailed. One of these latter vehicles struck and carried away an Up side mast of the overhead electrification structure, and collided with two wagons in an adjacent siding. The train split into three parts. The engine and the first 13 vehicles, all on the rails, came to a stand in Sandbach Station, but the engine had passed the starting signal by about 40 yd. One derailed vehicle stopped about 100 yd. in the rear. The remaining four vehicles, all derailed and damaged, stopped 50 yd. in the rear again. No one was injured, but extensive damage was done to the track and the overhead electric equipment.

The accident happened on a clear dry afternoon. The line between Holmes Chapel and Sandbach is, on the whole, straight and generally undulating. It is equipped with colour-light signals and is fully track-circuited.

Make up of train

The train was hauled by an English Electric 25/6·25 kV. 50 cycle a.c. electric locomotive. The first nine vehicles were bogie coaches of various kinds, then came six four-wheel covered goods vans and a four-wheel container flat. The last two vehicles were again bogie coaches. The four-wheel vehicles were screw-coupled to the coach ahead and to one another.

The regulations lay down that in every case where four-wheel vehicles of less than 15 ft. wheelbase are marshalled on a train, the guard must advise the driver before starting, so that the speed of 60 m.p.h. may not be exceeded while such vehicles are attached to the train.

An examination of the track indicated clearly the initial point of derailment, and that the vehicle had become derailed on the cess side. The vehicle initially derailed was the fourth of the six four-wheel vans, and the damage to its tyres showed that it had travelled with all wheels derailed for a considerable distance. The fifth four-wheel van came to a stand by itself, but the bruising of its tyres suggested that it had travelled derailed only over a short distance. The coupling from the leading end of the sixth van was found hanging from the trailing drawbar hook of the fifth van having been snatched from the Gedge's slot of the sixth van; its trunnions were still free on the screw. It was fitted with buffers that projected only 1 ft. 6 in. When two vans with 1 ft. 8½ in. buffers are close coupled, the buffers can be compressed, but when a vehicle with 1ft. 8½in. buffers is close coupled to one with 1 ft. 6 in. buffers, the buffers can at most be brought into contact.

Uneven screw coupling

A subsequent examination of this screw coupling showed that it was screwed unevenly, so that it was 2 in. longer than it need have been. The yard foreman at Stockport, where the last five vehicles were attached to the rear of the train, said that he did not inspect the vehicles on the train's arrival, as he was not responsible for their condition but only for their attachment. He had looked at some of the couplings, but had not noticed any couplings unequally screwed or buffers standing apart.

An examination of the first vehicle to leave the rails showed some variation in the bearing-spring eyebolt lengths. This must have been there before the accident, but the largest variation was 5/32 in., or well within the permitted tolerance of ½ in. But as a result of these variations, the loads on the four journals varied from 1 ton 1 cwt. to 1 ton 18 cwt. The fact that the van was nearly empty would have accentuated the ill-effects of this unevenness.

An examination of the track for 600 ft. immediately in rear of the initial derailment showed that it was generally in good condition and safe for speeds up to 90 m.p.h. But in the last 250 ft. there were small variations in cross-level that amounted to two minor but rhythmic and increasing reversals in cant.

The Sandbach signalbox log book showed the parcels train as having arrived at 4.9 p.m. The Crewe electric control-room log showed that the relevant circuit breakers had tripped at 4.9 p.m., and this could only have been due to the accident. Other signal-box log entries showed the parcels train as having left Stockport at 3.48 p.m., and passed Cheadle Hulme at 3.52 p.m. and Wilmslow at 3.57 p.m. Evidence was given that the clocks at Wilmslow and Sandbach were in correspondence.

The guard of the parcels train said that he knew about the speed limit of 60 m.p.h., and that he had told the driver that the train included, from Stockport onwards, seven vehicles with 10-ft. wheelbases. He did not feel any rough riding or anything unusual and knew nothing until he heard a bang and saw the vacuum, which had previously been falling, had fallen to zero. As soon as the train had stopped, he saw the effects of the derailment and at once went back along the line to protect his train.

The driver agreed that the guard had told him about the seven vehicles with 10 ft. wheelbases, and that he knew that the speed limit was 60 m.p.h. He was emphatic that signal No. 17 remained at green until he had passed it. Two hundred yd. farther on, he saw signal No. 44 at red. He at once reduced his vacuum to 15 in. to collect his train and then made a full application to bring the train to a halt. He claimed that his maximum speed up to this point had been 60 m.p.h.

When the train stopped he at once looked at his watch, which said 4.20 p.m. At first he said that he saw the guard before the guard went back to protect the train, but later agreed that it must have been on the guard's return. When told that an arrival time of 4.20 p.m. meant an average speed from Wilmslow of only 36 m.p.h., he expressed surprise, but was adamant that his watch had shown 4.20 p.m., and that his watch had never let him down. His firmness about his speed began to waver when he was told that the signalman's evidence suggested that if his speed approaching signal No. 17 was only 55 m.p.h., he must have had that signal showing red in front of his eyes for at least 5 sec.; whereas if his speed was a good deal more, he would have seen that signal at red for a much shorter time. At one point he admitted that his speed had probably exceeded 60 m.p.h., but he claimed that such an excess would have been only temporary, because as soon as he saw it, he would have had to brake down. When told that the Wilmslow and Sandbach signalmen's timing gave him an average speed of 70 m.p.h. throughout that section, he discounted the possibility of having driven so fast.

Inspecting Officer's conclusions

Colonel Robertson did not believe that either the driver or the guard looked at his watch when the train came to a stand, and saw that it read 4.20 p.m. He did not think they deliberately agreed to give false evidence, or they would have chosen an arrival time consistent with a more credible average speed, and the guard would have booked it in his journal. Probably the arrival time was estimated later and each man may have persuaded himself that 4.20 p.m. was correct. Colonel Robertson is quite sure that the train reached Sandbach at 4.9 p.m., when the circuit breakers tripped.

Calculations from an arrival time of 4.9 p.m. and the booked times recorded at preceding signalboxes show that the average speeds between Stockport and Cheadle Hulme, Cheadle Hulme and Wilmslow and Wilmslow and Sandbach were 32½, 47, and 70 m.p.h. respectively. At the point of derailment the speed can hardly have been less than 70 m.p.h. It was not nearly as high as a ganger's estimate of 90-100 m.p.h. It is always difficult to judge speeds from the line-side.

The main cause of the derailment was this excessive speed. It is likely that the driver, paying little attention to his speed-

ometer and relying on his own judgment, was misled by the silent running of his electric locomotive into under-estimating the extent of the increase in his speed.

Contributory factors

Contributory factors were the track inequalities, the derailed van's maladjustment, and the slack coupling one van's length to its rear. Slight though these defects were, they may have increased the tendency of the van to oscillate, while the slack coupling, which should have been noticed at Stockport, may have played a significant part in the break-up of the train. The track was not unsafe, provided that the prescribed speed limits were observed. This accident showed clearly that when speeds are high, minor variations in track and stock can combine to cause sufficient oscillation to derail a short wheel-based vehicle. It drew attention to the importance of the speed limit imposed on trains that include such vehicles.

Insufficient care

The driver probably had Signal No. 17 in view for less than four seconds after it had changed from green to red. It is, however, a driver's duty to keep a signal under observation until he has passed it, and his failure to see it change to red confirms Colonel Robertson's view that he was on this occasion driving with insufficient care. His reaction to Signal No. 44, when it changed to red, was not unsatisfactory, and he cannot be blamed for not stopping short of this signal. The guard should have kept a better lookout. Had he looked back along his train only once between Holmes Chapel and Sandbach, he might have seen the derailed van and have stopped the train before the initial derailment did further damage.

It was satisfactory that there was no arcing when the overhead wire was brought down on the train. Following representations to the British Transport Commission by the Chief Inspecting Officer of Railways, the steel bodies of all electrified stock used under the 25 kV overhead wire have been electrically bonded to the underframes to provide a safe path through which the high voltage can discharge to earth.

Laboratory for S.A.R.

The South African Railways' 13-storey laboratory building, under construction at an estimated cost of R857,000 on a site in the north-western section of the Johannesburg Station complex and facing Harrison and Leyds Streets, is well advanced. Seven floors, of which three are below street level, have been completed, and good progress is being made with the work on the remaining six floors which will be ready for occupation by September, 1962.

A feature of the building is that the three lower ground floors are not of the traditional underground "basement" type but face the railway yard and have windows.

Lower ground floors

The laboratories are provided with a.c. current from a transformer in the lower ground floor where there is also a generator supplying d.c. current of up to 5,000 A. for heavy-current tests. An air compressor which supplies compressed air to those laboratories requiring it is also installed here. Gas from the Bunsen burners is obtained from the municipal mains. The basement also houses the test and research laboratories of the Electrical Department and a darkroom for the testing of lighthouse equipment.

The lower ground floor next above houses research sections of the Electrical and Civil Engineering Departments as well as the system electrical, signals, and locomotive sections, while a storeroom with a sunken floor provides storage for inflammable liquids. Part of the Chief Electrical Engineer's test and research section, and the Chief Civil Engineer's soil research section occupy the lower ground floor just below street level. On this floor is a cinema which has seating accommodation for 81 people and can also be used as a lecture room.

Upper floors

The ground, first, and second floors accommodate various engineering and research sections, and certain rooms on the first and second floors are supplied with d.c. current at 6, 12, 18 and 24 V. from batteries in a battery room on the first floor, where there is also a generator supplying 220-V. d.c. current. Specially-equipped balance rooms have been built on the second floor. The tables which accommodate the balances are made of heavy, movable slabs resting on cork supports to eliminate vibration.

Equipment

The laboratories are being equipped with the most up-to-date apparatus for the testing of a wide range of commodities. Interesting accelerated-weathering machines, capable of simulating any weather condition and also up to five years of exposure to the elements in about 1,000 hours, will test such items as paints and tarpaulin textiles. Arc lights will provide the ultra-violet rays of sunlight and jets spraying de-ionised water will simulate rain, while thermal shock will be provided by controlled temperature changes ranging from maximum summer day to mininum winter night temperatures. There will be five of these machines.

On the electrical side there will be a machine for the exhaustive testing of traction motors including determination of brush performance, quality of new types of insulation, and even to study commutation problems.

Scottish train services

At a meeting of the Scottish Area Board of the British Transport Commission, members gave further consideration to plans to reorganise train services in Scotland.

The board was mindful of the statutory duty of the Commission as laid down in the Transport Acts to make ends meet taking one year with another, and also of the policy outlined in the Government White Paper which made it abundantly clear that the Railway Regions must act primarily as commercial concerns.

The principles underlying the closures and withdrawals of trains are based on the belief that a truly progressive railway system must adjust itself to changing circumstances paying full regard to present and probable future economic developments.

Certain services in Scotland are operating at a heavy loss, and where it is clear that they can never be made to pay the proposal is to cut the losses by withdrawing the least patronised trains.

An equally important part of the board's redevelopment programme is to provide additional services where there is sound economic justification for them, in fact, total passenger mileage in 1962 is expected to exceed that of 1961 by 1½ per cent.

Based on these principles are the current submissions to the Scottish Transport Users' Consultative Committee for the closure of the Burnmouth-Eyemouth branch; the Hawthornden Junction-Peebles-Galashiels lines, and the withdrawal of passenger services between Edinburgh (Princes Street) and Leith (North).

Since 1958 efforts have been made by the use of modern diesel traction to place both the Edinburgh (Princes Street)-Leith (North) and the Hawthornden Junction-Peebles-Galashiels branch lines on a sound financial basis but, in spite of some improvements, these efforts have not succeeded. On the Burnmouth-Eyemouth branch receipts have diminished over many years and the alternative public transport facilities are felt to be adequate.

When current consultations between management and staff are completed it is hoped to make a further statement.

Staff & Labour Matters

Railway workshop staff—Rates of pay

At a meeting of the Railway Shopmen's National Council on October 19, the Employees' Side of the Council submitted an application for a substantial increase in rates of pay for railway workshop staff.

The representatives of the British Transport Commission undertook to give a considered reply at an early date.

Shorter working week for railway shopmen

At a meeting of the Railway Shopmen's National Council on October 19, an agreement reducing the working hours of railway shopmen from 44 to 42 a week was ratified, negotiations as to the method of implementation having been satisfactorily concluded in the meantime at joint working party level.

The British Transport Commission made an offer to the Employees' Side last April to consider favourably a reduction in the standard working week for railway workshop staff to 42 hr. provided satisfactory arrangements could be agreed for its implementation in an efficient and economic way.

The agreement now reached takes effect from October 30, 1961.

Salaried and conciliation staff

Following consideration of the British Transport Commission's reply rejecting the claims of the three railway trade unions for improved rates of pay for railway salaried and conciliation staff, the executive of the N.U.R. has instructed the union's General Secretary to arrange an early meeting with the other two unions concerned to discuss a unified policy for pressing their claims.

Leaders of A.S.L.E. & F. have already stated they will use "every means at their disposal" to achieve their claim for a 10 per cent increase for locomotive staff.

The T.S.S.A. Executive will consider its attitude at a meeting early in November.

British Transport Commission traffic receipts

The following tables show the British Transport Commission's traffic receipts for four weeks ended October 8, 1961, compared with the corresponding period last year, and the percentage variation 1961 compared with 1960.

PERCENTAGE VARIATION 1961 COMPARED WITH 1960

	Four weeks to Oct. 8	40 weeks to Oct. 8
British Railways—		
Passengers	+ 4	+ 4
Parcels	+ 1·2	+ 0·7
Merchandise & livestock	− 4·0	− 0·3
Minerals	− 16·3	− 8·7
Coal & coke	− 6·4	− 2·7
Total	− 2·1	− 0·1
Ships, passengers	+ 8·5	+ 6·8
British Road Services, Inland Waterways & Ships (cargo)	+ 5·9	+ 8·0
Road Passenger Transport, Provincial & Scottish	+ 9·5	+ 6·3
London Transport—		
Railways	+ 7·3	+ 8·9
Road Services	+ 6·7	+ 4·1
Total	+ 6·9	+ 5·6
Aggregate	+ 0·8	+ 1·9

	Four weeks to		Incr. or Decr.	aggregate for 40 weeks to		Incr. or Decr.
	Oct. 8 1961	Oct. 9 1960		Oct. 8 1961	Oct. 9 1960	
	1961 £000	1960 £000		1961 £000	1960 £000	
Passengers—						
British Railways	12,122	11,445	+ 677	124,220	119,336	+ 4,884
London Transport—						
Road passenger services	4,776	4,474	+ 302	45,489	43,663	+ 1,826
Railways	2,213	2,061	+ 152	21,594	19,826	+ 1,768
Provincial & Scottish Buses	5,426	4,952	+ 474	51,547	48,488	+ 3,059
Ships	636	586	+ 50	7,046	6,593	+ 453
Total passengers	25,173	23,518	+ 1,655	249,896	237,906	+ 11,990
Freight, Parcels & Mails—						
British Railways—						
*Merchandise & livestock	7,974	8,308	− 334	77,104	77,371	− 267
*Minerals	3,165	3,782	− 617	33,850	37,085	− 3,235
*Coal & coke	8,421	9,003	− 582	79,302	81,506	− 2,204
*Parcels, etc., by coaching train	4,607	4,532	+ 75	43,172	42,851	+ 321
†Others	5,152	4,863	+ 289	48,941	45,310	+ 3,631
Total freight, parcels & mails	29,319	30,488	− 1,169	282,369	284,123	− 1,754
Total	54,492	54,006	+ 486	532,265	522,029	+ 10,236

* Includes receipts from collection and delivery, etc.
† Receipts from railway movements wholly within dock areas, included in previous periods under "Freight, Parcels and Mails," are now classified as miscellaneous.

CONTRACTS & TENDERS

Opportunities for railway exporters in Poland

Poland has announced a five-year development plan, some details of which are given on page 470. As the Polish economy is state-controlled, all imports into Poland must be made through state trading organisations. Documents giving details of the plan may be consulted at room 620, Lacon House, Theobald's Road, London, W.C.1.

A South African company, Dorman Long (Africa) Limited, has obtained orders for 100 covered wagons and 15 fuel-oil tank wagons for Rhodesia, and six petrol tank wagons for Nyasaland. These export orders will be carried out at the Dorman Long works in Germiston. Since 1944, when rolling stock was first manufactured at Germiston, Dorman Long has supplied more than 38,000 rail wagons to the railways in South Africa.

The Chilean State has called for tenders for a system of communications for the entire railway network, including teleprinters, radio receivers and transmitters, and telephones. Details may be obtained from the Departamento de Materiales, Ferrocarriles del Estado, Estación Alameda, Santiago, Chile. The closing date is October 31, 1961.

The Argentine Government is to import from Japan 200 electric motor coaches, rails, spare parts and other equipment worth $35,070,000.

John Mowlem & Co. Ltd. has just commenced work on a £300,000 contract at Immingham docks, Lincolnshire. The work involves a new jetty and repairs to an existing one and is due for completion in a year.

Matisa Equipment Limited has received the following orders:—

4 B-60 heavy-duty automatic ballast tampers fitted with automatic levelling equipment for Italian contractors.

1 CB5 ballast cleaner for the contracting firm of Giovanni Cioce.

2 heavy-duty tampers for Raymond International in Liberia.

1 PV5 track-recording trolley for the Boston & Main Railroad Company.

The Danish National Railways have ordered a large amount of equipment for track maintenance, including mechanical power wrenches, fish-plate nut adaptors, rail saws, rail drills and corrugation grinders.

The North Eastern Region of British Railways has placed the following contracts:—

Wilfred Fairburn Limited: provision of electric lighting and power at Hull Dairycoates motive power depot.

In connection with the repair of hydraulic buffers at Shildon Wagon Works:—

Tangyes Limited: supply of a 50-ton press;

Alfa-Laval Co. Ltd.: supply of automatic washing & drying equipment;

Imperial Chemical Industries Limited: supply of cleansing tank, for cleaning parts of buffers;

Fisher & Ludlow Limited: supply of a slat conveyor and gravity roller track.

British Railways, Scottish Region, has placed the following contracts:—

James Crawford & Sons Ltd.: finishing work on new offices at Sighthill freight terminal;

George Wimpey & Co. Ltd.: laying of foundation for weighbridge and of roadway to buildings at Sighthill freight terminal;

Tannoy Products Limited: supply and installation of loudspeaker equipment at Millerhill marshalling yard;

Production Methods Limited: provision of trailers at Sighthill freight terminal;

William Baird & Son Ltd.: renewal of superstructure of underbridge No. 38 at Princes Street, Perth.

Rhodesia Railways is reported by Barclays Bank D.C.O. to be planning expenditure of over £310,000 on additional rolling-stock, much of which is intended to carry additional tobacco traffic to Beira. £35,000 is to be spent on the installation of a fully mechanised sand-conditioning plant in the railways' foundry at Bulawayo.

The Export Services Branch, Board of Trade, has received calls for tenders as follow:—

From Eritrea :

10,000 kg. chemical water softener for locomotive boiler working at the pressure of 14 kg. per sq. cm.

50 kg. disincrustant for cleaning the cooling system of the diesel engines. (The chemical must be anti-rust and anti-corrosive.)

1,000 kg. pure tin ingots. (Purity above 99 per cent required.)

4,000 kg. synthetic and linseed oil paint

80 m. seamless copper tube, diameter 63 x 75mm.

100 m. soft copper rods, diameter 26 mm.

200 m. soft copper rods, diameter 27 mm.

200 m. soft copper rods, diameter 28 mm.

100 m. soft copper rods, diameter 29 mm.

50 m. soft copper rods, diameter 30 mm.

300 steel sheets, 1,000 x 2,000 x 2 mm.

50 steel sheets 1,000 x 2,000 x 3 mm.

5 turbo-electric generators of 110/120V. 500W.

500 tamping piks weighing about 3 kg. each

500 standard shovels, weighing about 1·2 kg. each

300 mason buckets, weighing about 3 kg. each

20,000 mild-steel electrodes of 4 mm. for overlays and general use (samples required)

10,000 electrodes of 3 mm. for overlays and general use (samples required)

3,000 special hard-steel electrodes hardness about 300 VPH
1,000 special hard-steel electrodes hardness about 700 VPH.
35 fire extinguishers of foam type of about 3-litre capacity
15 chucks for lathe (four of 300 mm., five of 270 mm. and six of 190 mm.)
48 wagon steel tyres per drawing
70 radiator elements for rail-cars as per drawing.

The issuing authority is the Imperial Ethiopian Government Railway & Ropeway, to which bids should be sent. The tender No. is R.A./1. The closing date is October 30, 1961. The Board of Trade reference is E.S.B./32557/61.

From Greece:—

1 metal-shaping machine, stroke 3—5·5 m. table width 0·90—1 m. for double tool-holder, for operation on 230/380V.

The issuing authority is the Purchasing & Stores Department, Hellenic State Railways, 34 Themistocleous Street, Athens, to which bids should be sent. The tender No. is 5244. The closing date is November 3, 1961. The Board of Trade reference is E.S.B./32502/61.

From The Irish Republic :—

Tenders are invited from contractors for the supply of wooden railway sleepers and crossings during 1962. Bids should be sent to the Purchasing Officer, Inchicore, Dublin 8. The closing date is November 1, 1961. The Board of Trade reference is E.S.B./32896/61.

From Pakistan:—

90,000 B.G. transverse steel sleepers for 100 lb. per yd. R.E. section rails.

The issuing authority is Pakistan Western Railway. Bids should be sent to the Secretary, Railway Board, Ministry of Railways & Communications, Karachi. The closing date is November 8, 1961. The Board of Trade reference is E.S.B./32597/61.

7 items of railway equipment including wheels, tyres, glut rings, wheels and axles complete, and roller bearings.

The issuing authority is the Chief Controller of Stores, Pakistan Western Railway, Lahore, to whom bids should be sent. The tender No. is PIC-268/1-61. The closing date is November 1, 1961. The Board of Trade reference is E.S.B./31996/61.

2,972 grinding wheels of various types and sizes.

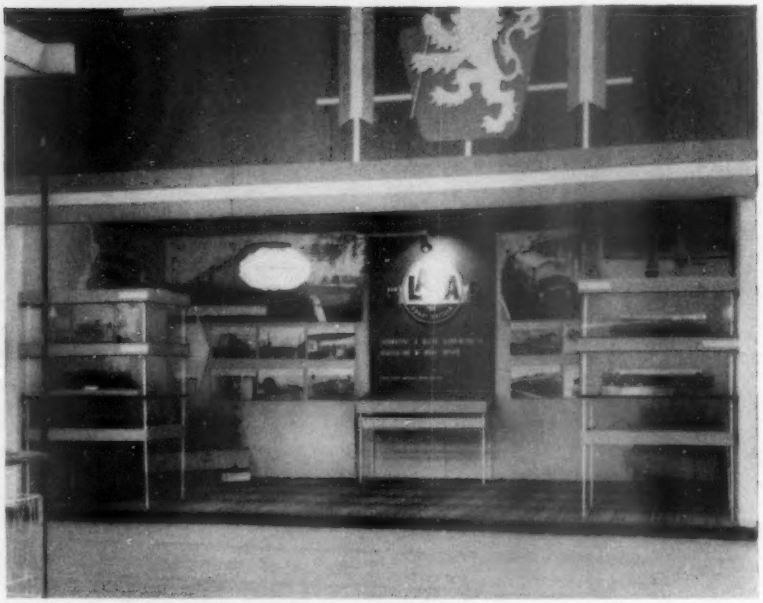
The tender No. is PIL/157/3-61. The closing date is November 9, 1961. The Board of Trade reference is E.S.B./31998/61.

58 axles
116 wheel centres
1,243 steel tyres.

All these items are for steam locomotives.

The tender No. is PIL/167/2-1961. The closing date is November 8, 1961. The Board of Trade reference is E.S.B./31997/61. The issuing authority for the above tenders is the Chief Controller of Purchase, Pakistan Western Railway, Empress Road, Lahore, to whom bids should be sent.

Further details relating to the above tenders together with photo-copies of tender documents, unless otherwise stated, can be obtained from the Branch (Lacon House, Theobald's Road, W.C.1).



British railway exhibit at New Zealand International Trade Fair

NOTES AND NEWS

British rail industry exhibit. The British locomotive and rail traction industry exhibited eight locomotive models and panels of photographs at the International Trade Fair held at Wellington, New Zealand, in August and September. The stand, which was organised by the Locomotive & Allied Manufacturers' Association, is illustrated above.

Royal Commonwealth Society. In the letter to the Editor from Mr. J. R. Bardsley, in our issue of October 13, on the subject of the Euston arch, Mr. Bardsley was incorrectly described as Secretary of the Royal Commonwealth Society. He has since drawn our attention to the fact that he has no official connection with the society.

Wrongly illustrated. The illustration on page 393 of our issue of October 6 showed R.S. sleepers being laid on Rhaetian Railways and not, as stated, " 101 " concrete sleepers being distributed on asphalted ballast on Swedish Railways.

Integration of Mirrlees and National Gas. As a preliminary step towards the full integration of the two companies in January, 1962, the spares departments of Mirrlees, Bickerton & Day Limited, and of the National Gas & Oil Engine Co. Ltd. are being combined into one unit. Telephone enquiries for spares after November 6 should be made to Ashton-under-Lyne 1861.

Industrial friction materials. The Small & Parkes stand at the Engineering Materials & Design Exhibition, which will open at Earls Court, London, on November 13, will exhibit " Sinter-Don " sintered metal friction materials for a wide range of wet/dry industrial applications; " Don " industrial brake linings and clutch facings, both woven and moulded; " Donflex " industrial clutch discs; " Karmal " engine packings; " Fepco " jointings; " Grooved Roko " and " Rook Nylon " transmission beltings.

Change of name. Racal Engineering Limited has changed its name to Racal Electronics Limited from October 1.

Institution of Locomotive Engineers. An ordinary general meeting of the Institution of Locomotive Engineers will be held on November 23, 1961, at 5.30 p.m., at 1, Birdcage Walk, S.W.1. Mr. E. S. Cox, a Past-President of the Institution and Assistant Chief Mechanical Engineer, British Railways, will present a paper entitled " Some problems in vehicle riding."

Severn tunnel accident. A diesel passenger train caught fire half-way through the Severn tunnel recently. There was an explosion in the motor under the first carriage, and clouds of smoke filled the compartments. After a short while the train was towed out of the Bristol end of the tunnel.

Lecture and debating society. The winter session of the London Midland Region Lecture & Debating Society commenced on October 12, with an illustrated lecture on " Planning the electrification of the Euston main line," by the Region's Planning Officer, Mr. F. L. Lambert.

Stainless steel processes. At the Engineering Materials & Design Exhibition at Earls Court from November 13-18 inclusive, Firth-Vickers Stainless Steels Limited will display several techniques in the manipulation of its stainless steels. In the welding field, known techniques will be demonstrated alongside

several new methods such as the shielded inert-gas metal-arc process. Cold forming operations and the resultant products will be displayed as well as various finishes. Examples of centrespinnings, shell moulding, and static casting will also be on exhibition.

Health conference for executives. The third health conference for executives will be held at the Connaught Rooms, London, W.C.2, on November 30.

Colour bar ended. Three railways in the Southern States of the United States have ended the colour bar in their waiting and refreshment rooms, and booking offices.

Travel agents convention. The 1961 Convention of the Association of British Travel Agents will be held at Scarborough from October 28 to November 2.

Electrification postponed. The electrification of the main line from King's Cross to Doncaster and Leeds in the Eastern Region of British Railways has been postponed and is unlikely to be begun before 1970. The Region's London suburban electrification plans from King's Cross to Hitchin and from Moorgate to Hertford are being reconsidered.

Powder metallurgy products. The specialised products which can be manufactured with a minimum of labour and often an increase in the efficiency of the part will be shown on the stand of Bound Brook Bearings Limited at the Engineering Materials & Design Exhibition at Earls Court (November 13-18). The capability of powder metallurgy to produce a variety of products in the bearing field with self-lubricating potentials and special-purpose filter material will also be on view.

Transport Committees on demonstration run. At the invitation of the Southern Region of British Railways, members of the Central Transport Consultative Committee and the Transport Users Consultative Committees for London, and the South Eastern Areas, were given a demonstration run on the newly electrified North Kent Line on October 16, to see the results of the modifications carried out to the rolling-stock on this line, which had earlier been the subject of considerable complaint.

Increase in French passenger fares. French Railways has announced that its passenger tariffs were increased from October 23, 1961. The old and the new basic rates per kilometre are : old basic rate, second class, 0·08 NF, first class 0·12 NF. The basic rate from October 23 is : second class 0·085 NF, and first class 0·1275 NF. There will be no change in the charge for seat reservation or in the supplements payable for the occupation of couchette sleeping berths.

British Electric Traction dividends. The British Electric Traction Co. Ltd. has declared the following dividends: on the 6 per cent Cumulative Participating Preference Stock, 3 per cent actual; on the 8 per cent Non-Cumulative Preferred Ordinary Stock, 4 per cent actual; on the Deferred Ordinary and "A" Deferred Ordinary Stock, 12½ per cent actual. The dividends will be paid less income tax at the standard rate on December 15, 1961, to stockholders whose names appear on the register at the close of business on November 9.

French railway strikes. Train services, particularly Paris suburban services and those around Marseilles and Dijon, were seriously disrupted on October 18. This was the culmination of three days of unrest by railway staff seeking pay increases from the Government.

Closure of L.M.R. goods depots. The London Midland Region of British Railways is to close Stoneyford Lane Sidings, near Tevershall, Nottinghamshire, and Cranford goods depot between Kettering and Thrapston on November 6 for all traffic except that dealt with through private sidings.

U.S. railway legislation proposed. It is reported that legislation to assist the railway industry in the United States of America will be sent to Congress by President Kennedy after January 1, 1962. The President said, when announcing plans for a study on which the proposed legislation will be based, that difficulties facing the nation's transport system will require increased leadership and action on the part of the Federal Government.

$1-million credit for Pakistan. The International Development Association has extended to Pakistan a development credit equivalent to $1 million to assist the Dacca/Narayanganj/Demra irrigation project. This project, the first of its kind to be carried out in East Pakistan, will increase agricultural production in a densely-populated and very poor area, and will also serve as a pilot project to provide information and experience which should be of value in developing irrigation in considerable areas of similar land in East Pakistan.

Royal Show, Nairobi, exhibit. The illustration shows the introduction to the East African Railways & Harbours pavilion, at the recent Royal Show at Nairobi, which displayed some of the various locomotives used on the Kenya/Uganda section of the railway since 1901.

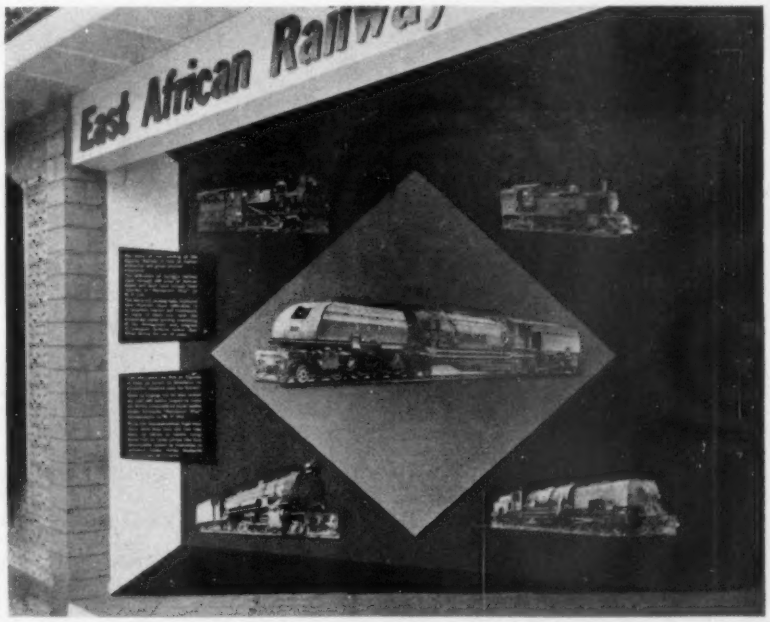
N.E. Region railway mayors. On October 24, Mr. F. C. Margetts, General Manager, British Railways, North Eastern Region, entertained to lunch 12 of the 13 railwaymen and retired railwaymen who have been elected to civic office on the North Eastern Region for the current year.

The 1000th Routemaster bus. The Rt. Hon. Lord Brabazon of Tara, Chairman of Associated Commercial Vehicles Limited, handed over the 1000th A.E.C. "Routemaster" bus to Mr. A. B. B. Valentine, Chairman of the London Transport Executive at a ceremony at Southall on October 16.

The first shop-welded bridge. On Saturday, October 21, the first truss-girder bridge of shop-welded fabrication and field joints with Torshear grip bolting, was rolled into position near Wheatly on the Oxford-Thame section of the Western Region of British Railways. It comprises a 105-ft. pony-truss span and carries the railway over the A.40 road.

Twelfth F.B.I. inquiry into industrial and export trends. The results of the 12th inquiry by the Federation of British Industry into industrial and export trends cover four months from June to September last. The detailed results show that the rising trend of output has continued as existing orders are fulfilled. More companies reported a decline in the rate of new orders and a shortening rather than a lengthening of order books.

Factory in Ireland. Allen West & Co. Ltd. has acquired the factory previously occupied by Lee Guinness Limited at Newtownards, Co. Down. The premises will be used for



East African Railways & Harbours window display at the 1961 Nairobi Royal Show

the assembly and wiring of standard contactor panels.

Change of address. The Newcastle-upon-Tyne area sales office of Alcan Industries Limited moved to new premises at Newgate House, Newgate Street, Newcastle-upon-Tyne, on October 2. The office, under Mr. N. P. Campbell, will serve Co. Durham, Cumberland, Northumberland, Westmorland, and Scotland.

Closing of stations. On October 2, facilities for handling freight were withdrawn from Oreston and Turnchapel Stations (Devon), on British Railways Western Region, and the line from Plymstock to Turnchapel was closed. The line was 2½ miles long and carried freight trains only, passenger trains being withdrawn in 1951.

Amalgamation of companies. The assets and liabilities of Owen & Dyson Limited were transferred on September 30, to the United Steel Companies Limited. The business of Owen & Dyson is now being undertaken by Steel Peech & Tozer, and the new department thus created will be known as the Fullerton machine shops.

Best-kept stations competition. The awards for the Eastern Region senior stations in connection with the best-kept stations competition for 1961 have been made. Grimsby Town received the first class award with challenge trophy, Southend-on-Sea (Central) second class, and Norwich (Thorpe) third class.

Channel Tunnel proposal endorsed. The Chairman of the Road & Rail Association, Lord Stonham, said on October 16 that the Channel Tunnel Study Group's proposal would provide the most dependable, economic, and flexible system of carriage so far envisaged and he hoped that the Government would endorse its conclusions as soon as possible.

Lobito rail traffic resumption. Rail traffic to and from Lobito, in Angola and Rhodesia via the Benguela Railway, and the rail systems of Katanga and Northern Rhodesia has been resumed. Traffic on the Katanga section of this shortest route to Central Africa was brought to a halt when fighting broke out several weeks ago in Katanga. Through trains are now running normally in both directions.

Murex extensions. Extensions costing in the region of £350,000 have been recently completed at the works of Murex Welding Processes Limited at Waltham Cross, Hertfordshire. The new buildings comprise a 500-ft. single-storey production shop for the manufacture of electric arc welding plant and a two-storey office block of 7,200 sq. ft. In extending the factory, care has been taken to retain existing gardens and other open spaces, and thus to preserve the aesthetic appearance of the works.

Black bitumen specification. B.S. 3416: 1961 provides for two types of black bitumen coating solutions. Type 1 specifies a brushing, spraying, or dipping material for the protection of iron and steel. Type 2 deals with material for the brush or spray coating of drinking water tanks. Copies can be obtained from the British Standards Institution, Sales Branch, 2, Park Street, W.1, price 7s. 6d. each, postage extra to non-subscribers.

Railway Stock Market

Among foreign rails, Costa Rica ordinary stock held steady at 38½, but Chilean Northern 5 per cent first debentures lost a point at 47½. Antofagasta ordinary stock was steadier, and at 16½ was maintained as compared with a week ago, while the preference stock strengthened from 35 to 35½, and the 4 per cent perpetual debentures kept at 40. Guayaquil & Quito assented bonds were 57½, and Paraguay Central prior debentures 18.

Mexican Central "A" bearer debentures remained at 57, but Brazil Railway bonds eased from 3¾ to 3½. Elsewhere, International of Central America common shares at $15½ were maintained compared with a week ago, and the preferred stock was again $90. San Paulo Railway 3s. units receded from 1s. 11¼d. to 1s. 9¾d.

Canadian Pacifics eased on balance from $44 to $43¾ and both the 4 per cent preference stock and 4 per cent debentures were quoted at 54½. White Pass shares have risen sharply to $13¼, their best of the year; a week ago they were $11¾.

Nyasaland Railways shares kept at 11s. but the 3½ per cent debentures came back to 35. Midland Railway of Western Australia unified stock was 11. In other directions, West of India Portuguese capital stock was 139½.

Among shares of locomotive building, engineering and kindred companies, Wagon Repairs 5s. shares declined from 25s. 3d. a week ago to 24s. 9d., but Gloucester Wagon 10s. shares rallied strongly from 7s. to 8s. 6d., accompanied by a revival of vague takeover talk. G. D. Peters were 16s. 10½d., but Charles Roberts 5s. shares declined from 5s. 3d. to 4s. 10½d., though Beyer Peacock 5s. shares remained at 6s. 3d. Birmingham Wagon lost 6d. at 26s. 6d. and North British Locomotive receded to 4s. Steel shares rallied, including Steel of Wales, which at 34s. 10½d. were slightly higher on balance despite the labour troubles. Guest Keen firmed up from 79s. 6d. to 80s. 3d., though elsewhere, T. W. Ward eased slightly to 67s. 6d. and Stone-Platt lost 1s. at 48s. while Ruston & Hornsby were 1s. 6d. lower at 20s. and now give a generous yield of 9 per cent. In other directions, however, Babcock & Wilcox have rallied from 20s. to 21s. 6d. Vickers at 26s. 9d. were within 3d. of the level a week ago.

Last week's sharp fall in Pressed Steel 5s. shares was followed by a rally from 16s. to 17s. 7½d. Dowty Group 10s. shares have been steadier at 33s. 3d., but Westinghouse Brake were still under the influence of the surprise concerning the British Transport brake cylinder contract, and remained at the lower level of 25s. 6d. recorded a week ago. Leyland Motors rallied to 79s. 6d., Tube Investments were higher at 58s., but British Oxygen 5s. shares at 15s. 3d., failed to recover their recent decline. In electricals, B.I.C.C. held at 55s. 3d., and Crompton Parkinson 5s. shares were 11s. 7½d. in front of the results. A.E.I. rallied from 29s. to 30s. 6d., G.E.C. from 24s. 3d. to 25s. 3d. and English Electric from 26s. 3d. to 28s. 9d.

Forthcoming Meetings

Nov. 1 (*Wed.*). Electric Railway Society, at the Fred Tallant Hall, 153, Drummond Street, N.W.1, at 7 p.m. "Rolling-stock of the Central London and London & North Western Railways." Mr. B. J. Prigmore and Mr. F. G. B. Atkinson.

Nov. 1 (*Wed.*). The Permanent Way Institution, at the Amersham Arms, New Cross, at 7 p.m. "Unknown railways," by Mr. Ronald Shephard.

Nov. 3 (*Fri.*). The Railway Club, 320, High Holborn, W.C.1, "Early East Anglian Railways 1835-1862," by Mr. B. D. J. Walsh.

Nov. 7 (*Tue.*). Institute of Transport, annual anniversary luncheon at the Connaught Rooms, Great Queen Street, London, W.C.2, at 1 p.m.

Nov. 7 (*Tue.*). Institute of Traffic Administration London Centre, at Caxton Hall, London, S.W.1, at 6.30 p.m. "Traffic engineering in practice," by Mr. Ernest Davies.

Nov. 7 (*Tue.*). Institute of Traffic Administration, Southampton Centre, at Royal Hotel, Southampton, at 7.30 p.m. "The work of the railway traffic superintendent," by Mr. A. C. J. Payne.

Nov. 8 (*Wed.*). Peterborough Railway Discussion Group, Peterborough Technical College, at 6.45 p.m. "History of motive power," by Mr. C. Hamilton-Ellis, Public Relations & Publicity Office, British Railways, Eastern Region.

Nov. 9 (*Thur.*). British Railways, London Midland Region, Lecture & Debating Society. Friends Meeting House, Euston Road, at 5.45 p.m. "An inlook at the outlook in East Africa," by Sir Arthur F. Kirby, Commissioner for East Africa.

Nov. 11 (*Sat.*). The Permanent Way Institution, East Anglia Section, Cambridge, annual general meeting and lunch.

Nov. 15 (*Wed.*). The Permanent Way Institution, 222, Marylebone Road, N.W.1, at 6.30 p.m. "Welding of switches and crossings," by Mr. C. I. Smythe.

Nov. 15 (*Wed.*). Institution of Railway Signal Engineers, at the Institution of Electrical Engineers, Savoy Place, W.C.2. "New signalling developments on the S.N.C.F.," by Mr. J. G. Walter (S.N.C.F.).

Feb. 23, 1962 (*Fri.*). Royal Engineers Army Emergency Reserve (Transportation). Annual Dinner. Cafe Royal, Regent Street.

OFFICIAL NOTICES

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October 27, 1961

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